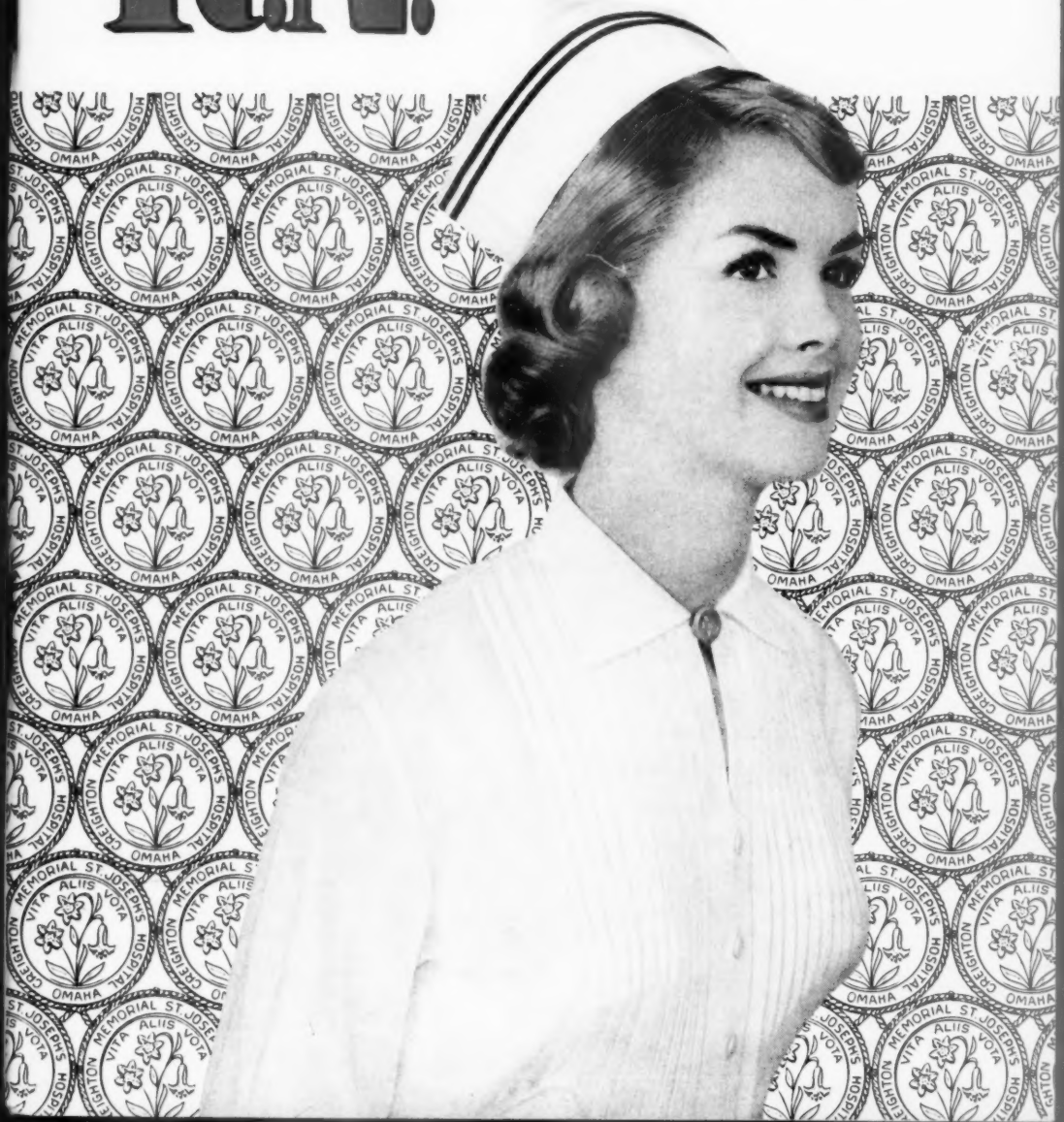
R.N.

A JOURNAL FOR NURSES

JANUARY 1957



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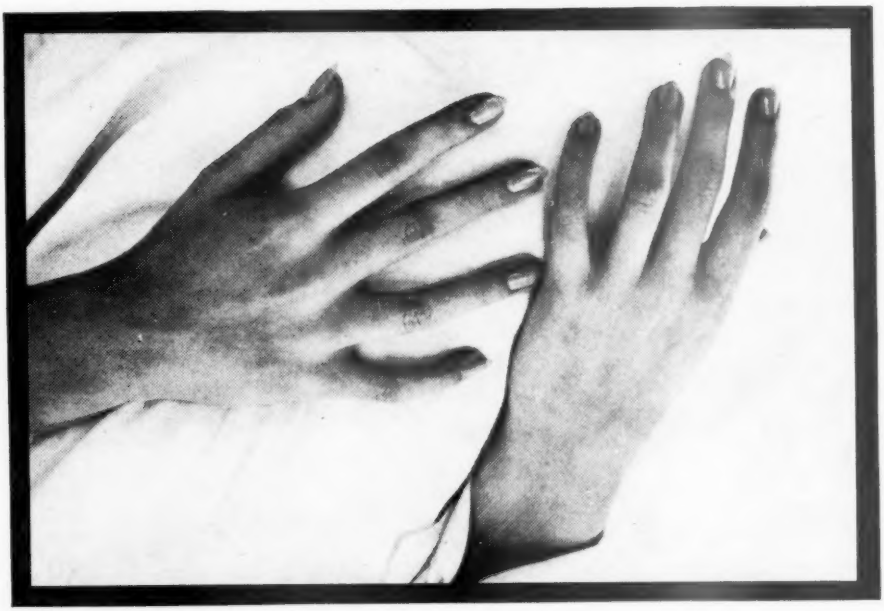

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BY COL. BYRON E. POLLOCK, M.C.
Chief of Cardiology Service, Fitzsimons Army Hospital, Denver, Colo.
AND MAJ. DOROTHY E. KRAFTSCHENCK, ANC
Head nurse, Fitzsimons Army Hospital, Denver, Colo.

→

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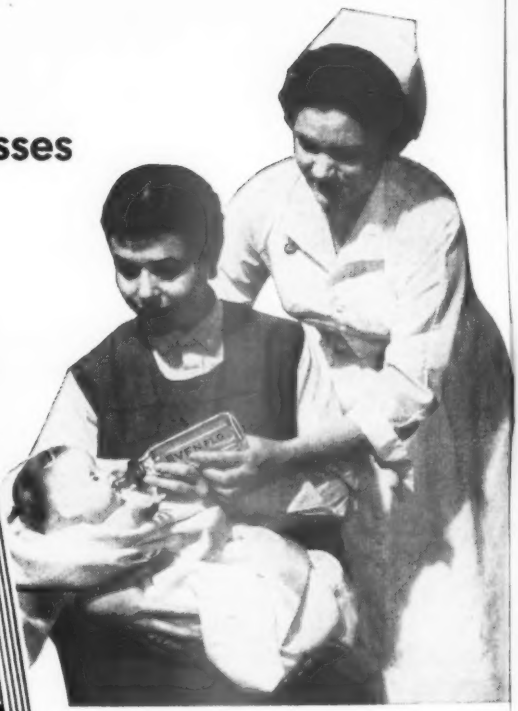

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The unbeatable team of improved antibiotics, advanced anesthesia, and pioneering surgeons has brightened the outlook of many patients with congenital cardiac anomalies.

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Associate Professor of Medicine, University of Colorado School of Medicine, Denver, Colo.

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Head nurse, Fitzsimons Army Hospital, Denver, Colo.

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Associate Clinical Professor, University of Colorado School of Medicine, Denver, Colo.

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Assistant Professor in Medical Surgical Nursing, University of Colorado School of Nursing, Denver, Colo.

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EDITORIAL STAFF

CREDITS: *Cover—Cap and pin: Creighton Memorial St. Joseph Hospital School of Nursing. Photographer: Walter Herstatt. Illustrations—"Therapeutic Notes", Parke, Davis & Co. (pages 38, 83, 67); American Heart Association (pages 41, 44, 46, 51); "Physiology and Anatomy" by Esther M. Greisheimer, published by J. B. Lippincott Co. (page 42); Sanborn Company (page 45); U.S. Army photographs (pages 48, 49, and 58); "Diagnosis of Congenital Cardiac Defects in General Practice" by Regina Gluck, M.D., published by American Heart Association (pages 52, 53, 54, and 56); Gomco Surgical Manufacturing Co. (page 59); The Philadelphia "Evening Bulletin" (page 62); Department of Radiology, The New York Hospital-Cornell Medical Center (page 64); Taylor Instrument Company (lower left, page 75); W. A. Baum Company (upper right, page 75); art based on illustrations from "PB", published by Eli Lilly & Co. (pages 76, 77); "Nomenclature and Criteria", prepared by New York Heart Association (pages 78, 79); Marion H. Whiting (pages 84, 85).*

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LETTERS

TERMINOLOGY

Dear Editor:

We should change the designation "R.N." (before others change it for us) to "Medical Assistant," "Nurse Technician," or just "Overseer"—since today's R.N., busy with her record-keeping, very often doesn't even see the patient.

I remember when our saintly Miss [Anne] Goodrich advocated that the word "nurse" be applied only to the R.N. She visualized, of course, a time when the advance of science would force the partly trained worker to qualify by obtaining more education before continuing her career.

At one time we were accused of "nursing the M.D." I feel now that the hospital is being nursed. Maybe we'll eventually get around to the patient!

ELIZABETH SHELLABARGER, R.N.
TEMPE, ARIZ.

CAP DILEMMA

Dear Editor:

I am a graduate of a wonderful school of nursing in Pennsylvania. We have a very attractive cap and I am proud to wear it. But here in Florida, where I now work, I have been asked to add a black band to my cap—a custom among Florida nurses as a means of helping patients to distinguish the R.N. from the practical nurse, and a requirement for charge nurses and office nurses. I have not made this change because it seems false and against the honor of my school. Before writing to the school, I would like to know how nurses elsewhere feel about the matter. Has anyone had this problem arise, and what did she do about it?

R.N., FLA.

DISASTER NURSING

Dear Editor:

One of your readers mentions the difficulty which she thinks may be encountered in reeducating the public and the profession to the idea that the seriously ill and injured won't receive immediate attention in major disasters.

My understanding is that first aid (including sedation as needed) will be given as soon as the injured can be reached by the medical teams. However, I think that anyone can see the practicality of deferring time-consuming surgery in order that a

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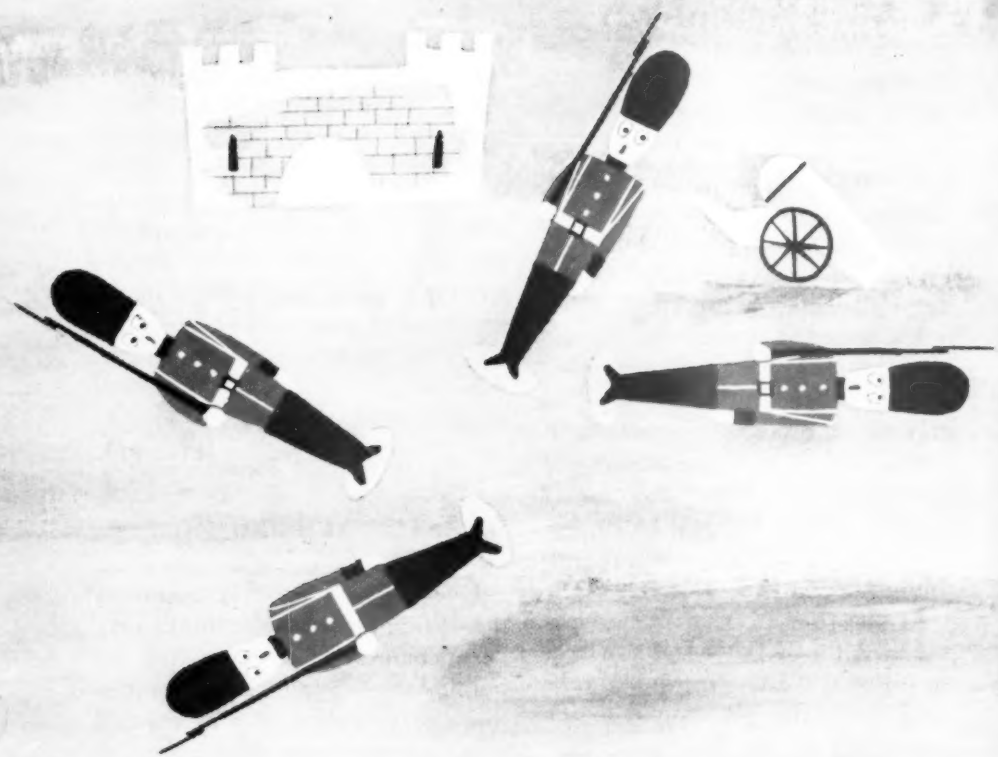

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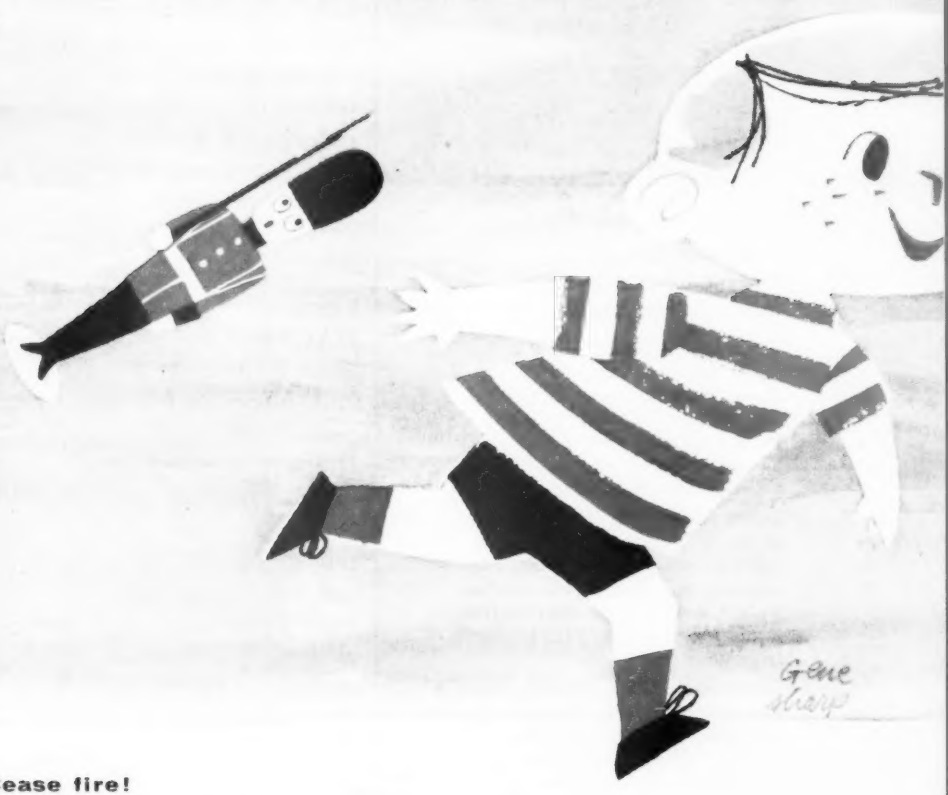

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LETTERS

continued from page 13

larger number of people can be treated and returned to their jobs.

Those of us who served with the armed forces remember the system of triage which embodied this principle and which would be used in a major disaster. In combat areas, servicemen with minor injuries were treated on the spot (so to speak) and returned to duty. The more seriously injured were given first aid, made as comfortable as conditions would permit, and transported to hospital installations. In no case did patients lie completely unattended once they were seen by medical personnel.

(Mrs.) RACHEL FRANCIS, R. N.
HILL, N.H.

HARVEST?

Dear Editor:

A form letter which I received recently from the Massachusetts Division of Employment Security urges inactive nurses to volunteer for full-time or part-time duty to relieve hospital staff shortages.

I can't help wondering if perhaps the nurse shortage isn't due—at least in part—to what could reasonably be called "the harvest of the seed sown over many years."

It certainly is expecting a lot to ask a woman to leave a home, where she is loved and well treated, to step into a job, emergency or no, where she might be subject to ill-tempered supervisors or head-

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LETTERS

nurses impatient with her slowness and with little or no consideration for her outside interests.

Not long ago, a supervisor tartly told me that "the hospital should be much more important than family." I object. My four children, my husband, and our farm (to say nothing of my activities in the Girl Scouts, 4-H, and farm bureau programs) are all a great deal more important to me than subjecting myself, eight hours a day, to some dyspeptic, impatient, old grouch intent only on handing out orders.

Kindness and consideration by hospital administration, from head nurse to superintendent, would go a long way in my book to increase the number of nurses willing to resume practice.

(Mrs.) MARION G. ZURETTI, R.N.
WESTBORO, MASS.

CONFIDENCE RESTORED

Dear Editor:

I, too, want to praise R.N.—both the magazine as a whole and Janet Geister in particular. Stepping out of a sheltered little nursing school into run-of-the-mill hospitals where the welfare of the patient seemed to be the last, rather than the first, consideration was a rude awakening for me. But before complete disillusionment set in, along came R.N., freely admitting that things are not right in our hospitals and earnestly trying to figure out what to do about it. Month by month

since then, R.N. has refreshed me and restored my confidence in the future.

(Mrs.) ALICE FAHRBACH, R.N.
CLEVELAND, GA.

PROGRESSIVE-MINDED

Dear Editor:

I cannot begin to tell you how much I look forward to each month's issue of your journal. This inspiring little magazine seems to bring all R.N.'s into a spiritual sorority whose members, though unknown to one another, have the same goals and dedications.

Recently, I have organized classes for mothers-to-be who are patients of the doctor for whom I work. Attendance so far has been rather discouraging, but I am hoping that the next group will be larger. To stimulate interest, I obtain free samples of products and literature to distribute to those who attend the classes—which, incidentally, are held at the doctor's office.

(Mrs.) RUTH YAEGER, R.N.
LITCHFIELD, ILL.

R.N.-PATIENT REPORT

Dear Editor:

In the past four years, I've been a patient in three different hospitals in our county and have received good care (medication and food) in each. In all three, the entire personnel—from superintendent to janitor—worked to furnish each and every

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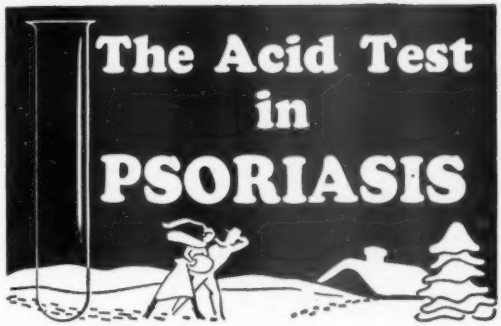

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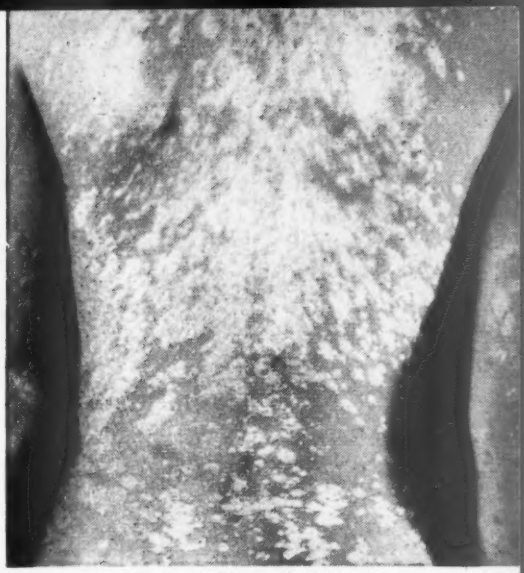

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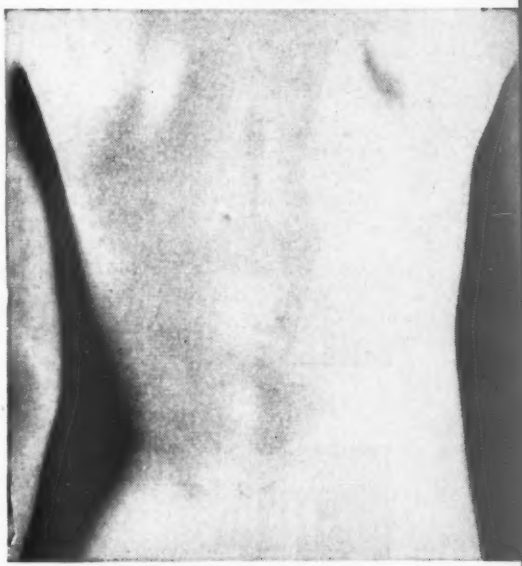

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FRANCES A. DESONIA, R.N.
DAVISON, MICH.

COMPETITION

Dear Editor:

We enjoy R.N. every month. We are industrial nurses in a large manfacturing concern. Our employes start at $1.50 an hour and receive such fringe benfits as Blue Cross-Blue Shield coverage, group life insurance, paid vacations, sereral paid holidays, workmen's compensation, and other benefits too numerous to mention. Such working conditions make it quite apparent why many young girls are not going into schools of nursing.

It is a sad commentary on our way of life when a nurse gets paid a wage differing little from that of a starting factory worker who has had no higher education or special training. Our women employes need no high school diploma or experience; they are taught on the job.

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CHARLOTTE P. BODOVINUS, R.N.
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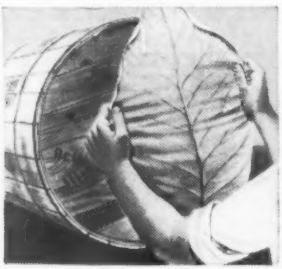

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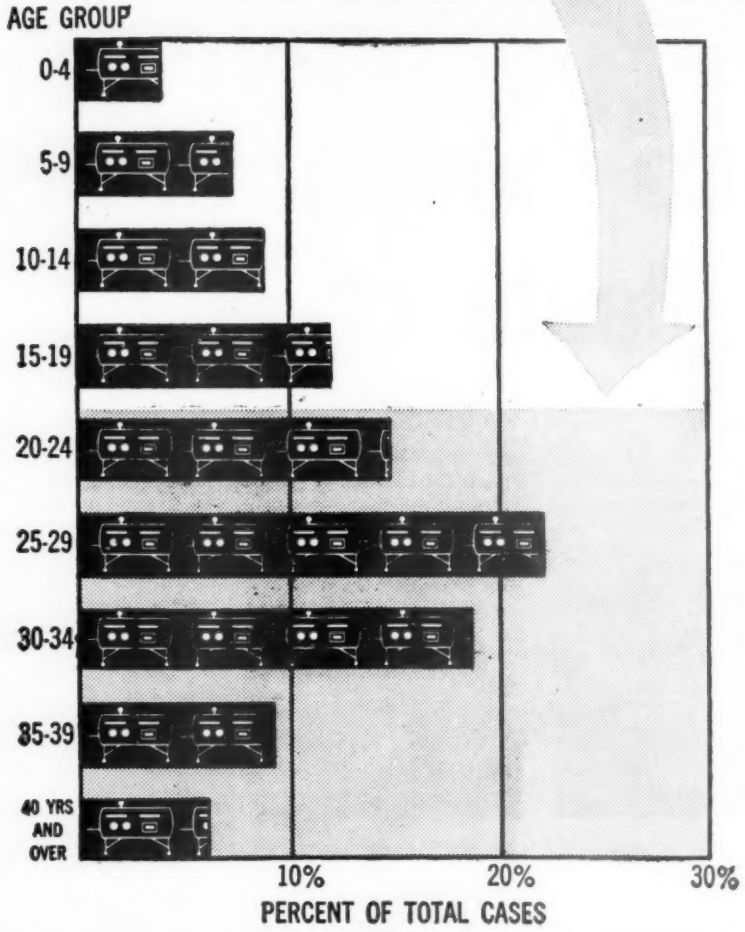

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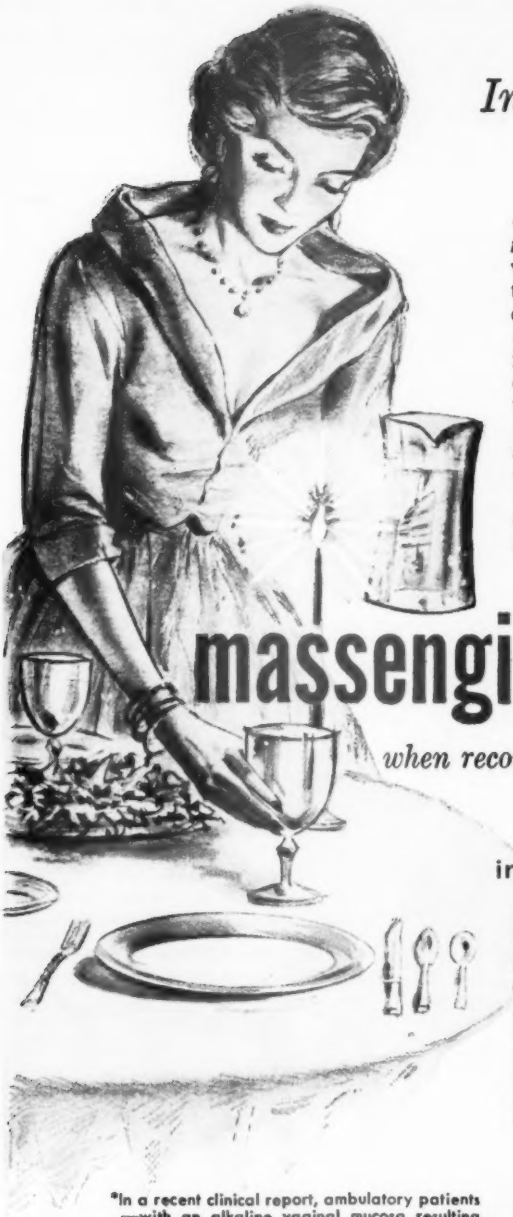

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*Arnot, P. H.: West. J. Surg., Obs., and Gyn. 62:85

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1. Grayzel, H. G., and Schapiro, S.: Western J. Surgery, Obstet. & Gyn., Oct. 1956.

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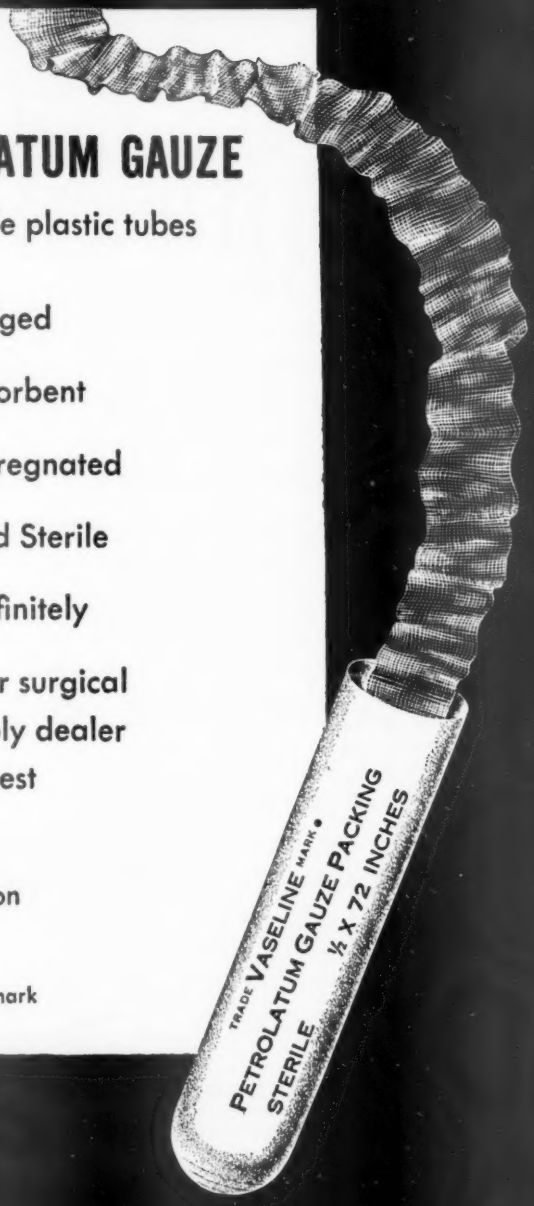

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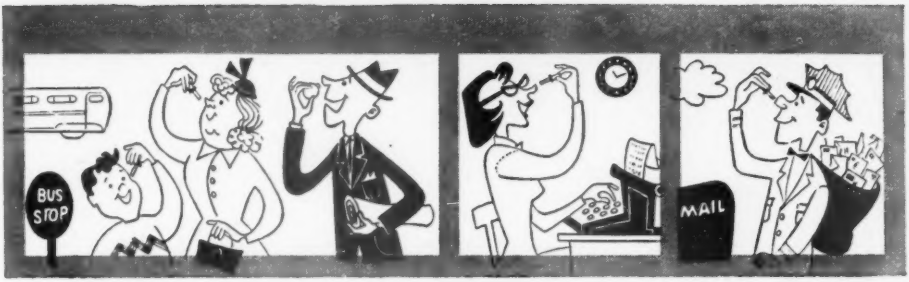

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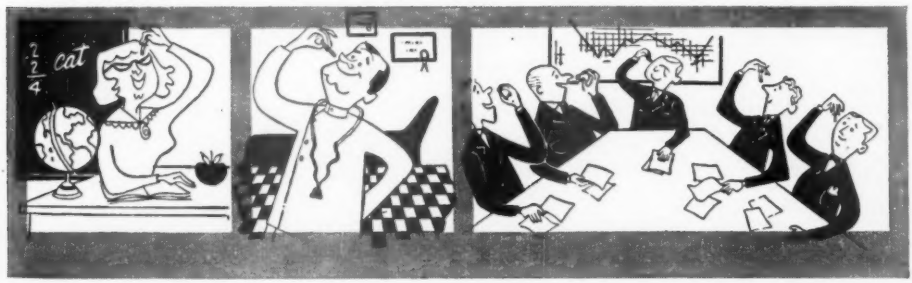

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Usual Dosage: 10 to 20 mg. *before meals* and at bedtime.

References: **1.** Rosenberg, H. N., and Michelson, A. L.: Am. J. M. Sc. *230*:254 (Sept.) 1955. **2.** Kory, R. C., *et al.:* Am. Heart J. *50*:308 (Aug.) 1955. **3.** Winsor, T., and Humphreys, P.: Angiology *3*:1 (Feb.) 1953. **4.** Plotz, M.: New York State J. Med. *52*:2012 (Aug. 15) 1952. **5.** Dailheu-Geoffroy, P.: L'Ouest-Médical, vol. 3 (July) 1950.

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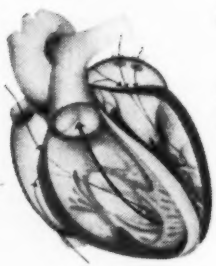
Cardiac Symposium: Prologue

Have you ever attended a stimulating meeting, or taken a particularly rewarding course, and found yourself wishing that others you know might have had the opportunity to share your experience? Such an opportunity was offered when the University of Colorado School of Nursing permitted R.N.'s editor to attend and record a five-day cardiac nursing institute last July.

The possibility of sharing the contents of this institute with our readers, in the form of a cardiac symposium, was recognized when the university, and its co-sponsors, W. K. Kellogg Foundation, Colorado Heart Association, Colorado Nurses Association, and Colorado League for Nursing, announced the course.

That some sixty nurses, representing many varied positions in nursing, traveled to the university's campus at Boulder, Colo., from points north, south, east, and west, was proof of the profession-wide interest in cardiac nursing.

Seventeen hours of recorded clinical, medical, and nursing lectures on the cardiac patient, condensed and edited for this special issue, plus additional staff-written and specially prepared articles to round out the symposium, can, fortunately, be passed along to R.N. readers. But, unfortunately, what was learned in group discussions about ourselves, our professional attitudes, our sensitivity or lack of sensitivity to cardiac patient needs, can only be known to the participants; all that can be done about it here is to share some lasting impressions.



In what would generally be considered an academic environment—a classroom setting—the social, economic, and health problems involved in specific cardiac case studies

came vividly alive. And sixty individuals became practicing nurses, coping with hypothetical, yet suddenly very real, nursing problems.

In five days and nights of close association and twelve hours of intense and sometimes traumatic group processing, much can be learned about oneself and one's colleagues. As we probed our reactions to these case-book patients, exposing and exploring our thought processes for group comment, we gradually became aware of individual and group attitudes, and of understanding or lack of understanding of human behavior—our own as well as patients'. It was painful, as we uncovered prejudices of which we were not aware; shocking, as we demonstrated an incomprehension of what these patients were trying to communicate to us; and traumatizing, as we began to recognize that our own fears of heart disease were preventing us from meeting the cardiac patients' needs.

An individual suffering physical and emotional anguish following a coronary occlusion, or facing life-or-death heart surgery, cannot be reassured by an insecure nurse who refuses to allow him to talk about his condition for fear that she will reveal her own inadequacies in the situation.

We found at the submerged level of our thinking that we all held a closely guarded fear that a malfunctioning heart is synonymous with sudden death. We admittedly needed much more education in cardiology before we could even begin to reassure an apprehensive patient.

In analyzing the case-book nurses' approach to their patients—how they succeeded or failed in their ability to make the patient *continued on page 88*

The Anatomy and Physiology of the Heart and Great Blood Vessels*

by Frances Elder, R.N.

THE most remarkable organ in the human body is the heart. Weighing less than a pound and measuring little more than a fist, this powerful, hard-working member of the circulatory system truly sustains life. By its continuous pumping action it forces blood to circulate through the tissues, transporting oxygen and other life-giving materials and removing waste products.

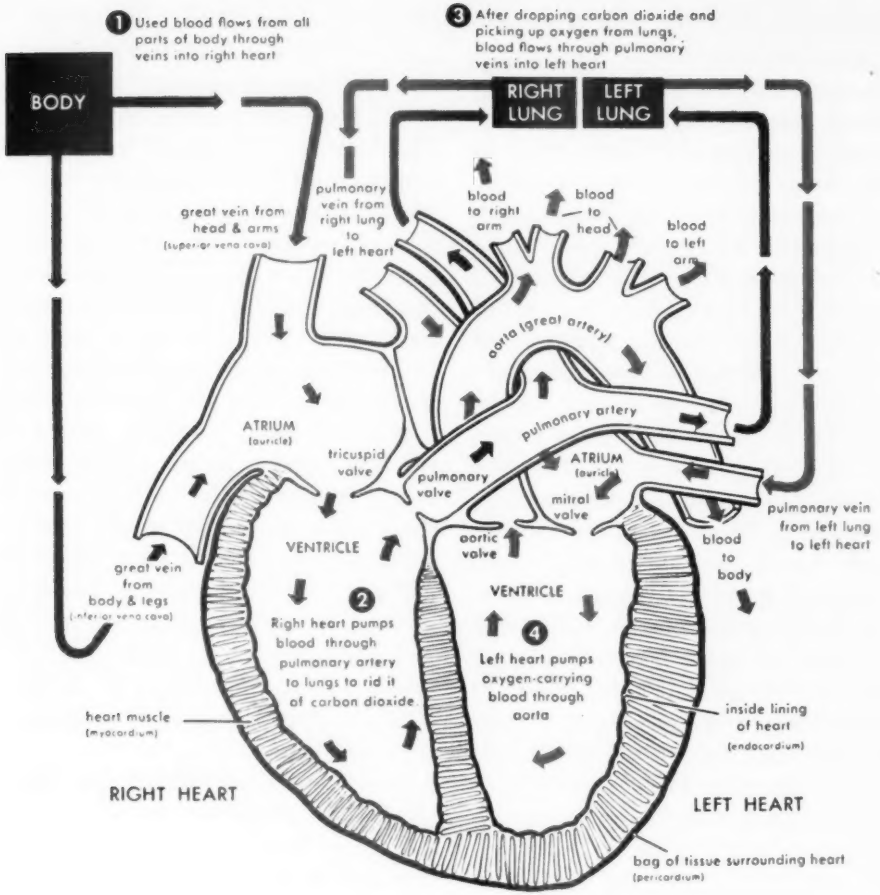
The heart lies to the left of the body midline, in a close-fitting fiberlike sac in the mediastinum between the lungs. In the narrow space between the heart and the protective pericardial sac, or pericardium, is a lubricating fluid which allows the muscular organ to beat freely without sticking or rubbing. If the pericardium becomes infected, fluid may be increased or pus may accumulate, disturbing the normal activity of the heart.

The inner lining of the heart, the endocardium, is a thin, strong membrane which forms the valves of the heart and lines the blood vessels. Acute bacterial infections of this endocardial lining (bacterial endocarditis) are generally fatal in a short period of time. Subacute bacterial endocarditis, a complication of pre-existing heart disease, is more amenable to treatment.

Sandwiched between the endocardium and the pericardium is the tough muscular wall of the heart—the myocardium. In contrast to skeletal muscle, this highly specialized muscle tissue is able to contract with and without stimulation. It can also contract at a continuous rate without tiring. Damage to the myocardium through injury, inflammation, or disease, may impede the strong pumping action of the heart, for unfortunately, in the healing process, injured cardiac muscle is replaced by rigid scar tissue.

The cavity of the heart is divided into right and left halves by a partition or septum. Each half has an upper chamber called an atrium or auricle, and a lower chamber, or ventricle. The atria and ventricles are separated by valves which allow blood to flow from the upper to the lower chambers, but not in the opposite direction. The valve separating the right atrium from the right ventricle is called the tricuspid valve because of its three cusps or flaps of endocardial tissue. The valve in the left half of the

*Due to recording difficulties, it was necessary for **R.N.** to augment the lecture by Janet Velasquez.



heart is known as the mitral or bicuspid valve because of its two flaps and its resemblance to a bishop's miter.

A clearer idea of the route of circulating blood is gained by identifying the blood vessels which enter and leave the four chambers of the heart. Entering the right atrium from the top is the superior vena cava, a flabby, easily collapsed vein that pours blood by simple gravity into the receiving chamber. This venous blood is collected from the vessels of the upper extremities, neck, and head. Coming up from below is the inferior vena cava which brings back blood and its waste products from the legs, the alimentary tract, the excretory system, reproductive system, etc.

This "blue" deoxygenated blood which is poured into the right atrium via the superior and inferior vena cavas passes through

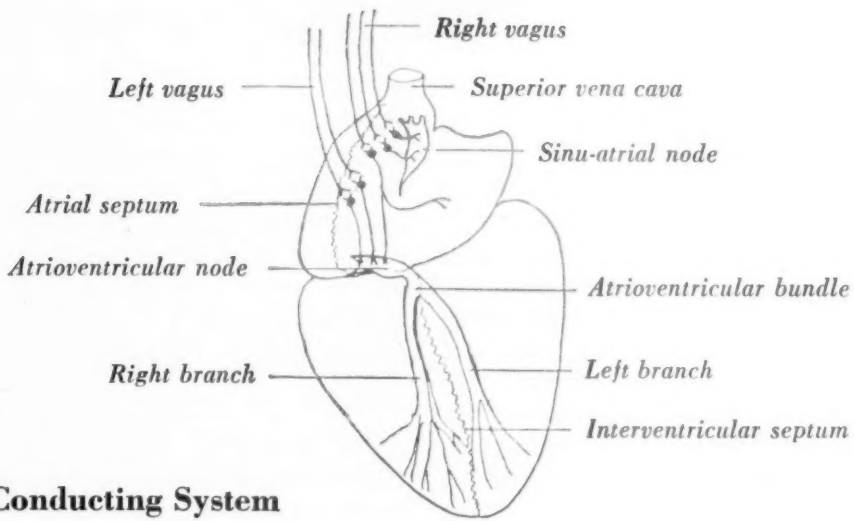
the tricuspid valve into the right ventricle. From here it is pumped through another valve, the semilunar pulmonic valve, into the pulmonary artery which conveys it to the lungs where it can get rid of carbon dioxide and pick up a fresh supply of oxygen.

The reconditioned "red" blood returns from the lungs by way of four pulmonary veins which enter the left atrium. It passes through the bicuspid or mitral valve to the left ventricle and is then pumped through the aortic semilunar valve to the aorta, the largest artery in the body. The aorta sends oxygenated blood into the systemic circuit which covers all portions of the body except the lungs. Because the left side of the heart must pump blood through the entire body, its muscular walls are stronger and thicker than those on the right side which has the lesser function of pumping blood through the lungs.

The normal heart sounds consist of a deep, booming "lub" followed by a sharp, clicking "dub." The deep "lub" sound is due to the vibration of the heavy ventricular muscles and the snapping shut of the atrio-ventricular valves. The second, softer sound is made by the snapping shut of the pulmonic and aortic valves.

There's a significant relationship in the position of the three vessels —the superior vena cava, the ascending portion of the aorta, and the pulmonary artery—across the base of the heart. The cardiac surgeon may find it difficult to differentiate between a badly sclerosed pulmonary artery and the aorta by palpation alone, but awareness of this 1-2-3 relationship will guide him in identifying and isolating the vessels.

Both pumps of the heart, the



Conducting System

right heart which pumps blood through the lungs and the left heart which pumps blood to all parts of the body, operate almost simultaneously. While blood is passing from the right atrium through the tricuspid valve and into the right ventricle, blood is also passing from the left atrium through the mitral valve and into the left ventricle. At the same time that blood is being pumped through the pulmonic valve and the pulmonary artery, other blood is going out through the aortic valve and the aorta. The period of contraction—the working and pumping period—is called systole. The period of relaxation—when blood is filling the chambers—is called diastole.

No one has yet discovered the secret of life locked within cardiac muscle. No one can explain satisfactorily why the nodal tissue in the heart can stimulate its own action—its own contraction, and do this automatically and relatively rhythmically. Researchers' attempts to keep the isolated heart beating in the laboratory have succeeded up to a certain point, but despite efforts to duplicate the heart's natural environment, eventually the heart beat stops.

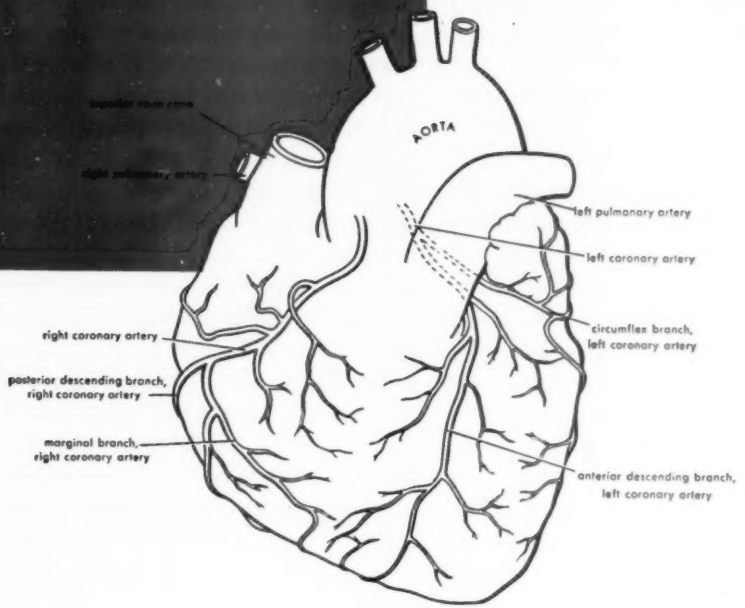
On the other hand, much is known about the conducting system which synchronizes the heart's cycle. The impulse to beat, regardless of what influences or controls it, ordinarily begins at the sinu-atrial node, a small portion of nodal tissue in the right atrium, near the entrance of the superior vena cava. Because this node generally claims the most rapid rate of impulse formation it serves as a pacemaker in stimulating contractions of the heart. However, if the sinu-atrial node should become depressed or other nodal tissue become more active, a new pacemaker may assume control.

In the normal heart, the sequence is usually this. The impulse to beat originates in the pacemaking sinu-atrial node, spreads over both atria, and recollects at the atrio-ventricular or AV node, another concentration of nodal tissue found at the top of the ventricular septum. From the AV node, the impulse spreads through the bundle of His, a thicker concentration of nodal tissue running through the ventricular septum. Continuous with the branches of the bundle of His are the Purkinje fibers which mark the end of the impulse route. There is a period of rest before the next impulse starts along the same pathway.

If there is an interruption in this cycle of the impulse to beat, that is, a block in the bundle of His, we would expect the ventricles to stop beating. But this is not true. Patients with so-called bundle block have a ventricular beat as well as an atrial beat, and this is because little bits of scattered nodal tissue through the ventricles are aroused to action by the stoppage of the more regular firing of contraction

continued on page 106

Medical and Nursing Management of Patients with Coronary Heart Disease



CORONARY heart disease claims a tragic toll in lives each year. In fact, it is our most serious national affliction.

Actually, the chief trouble maker in coronary heart disease is not the heart; is the coronary arteries that carry blood from the aorta to heart muscle or myocardium. Ordinarily the blood carried by these arteries enables the myocardium to perform its pumping action efficiently; but when blood supplies are reduced by diseased arteries. heart action is likely to be affected.

The heart muscle's blood supply of oxygen and nutrients comes from two major arteries, the left coronary artery and the right coronary artery. These branch into smaller vessels that cover the surface of the heart and penetrate the muscle down to the endocardial lining. The left coronary artery is most

by Col. Byron E. Pollock, M.C. and
Maj. Dorothy Kraftschenck, ANC

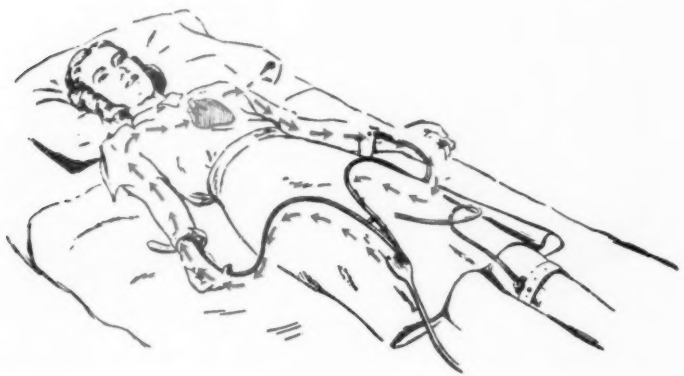
commonly involved in degenerative disease, and one of its two main branches, the anterior descending branch, running down the front of the heart between the right and left ventricles, is the most common site of coronary occlusion leading to myocardial infarction.

The so-called collateral circulation of the heart where the blood vessels become small and develop minute communications is especially important in coronary artery disease. If a vessel becomes gradually occluded, these small branches will enlarge to provide a substitute route for the blood that was previously carried by the occluded artery.

What kinds of degenerative diseases affect the coronary arteries? The rarest kind, which has been found in a few infants, involves the middle layer of the artery supplying the heart. This layer hardens and calcifies, and the innermost layer of the coronary vessel becomes so thick that it obstructs the coronary circulation. Some infants die suddenly, showing no clinical symptoms; in others, death is preceded by shortness of breath, cyanosis, and convulsions.

The cause of this infantile arterial disease is not known. It is believed, though, that an alteration of phosphorus and calcium metabolism may be responsible. Some of the babies, it seems, had received extensive doses of vitamin D.

Far more prevalent than this rare affliction is atherosclerosis of the coronary vessels, a condition found in the aged as well as in a considerable number of younger people. The deteriorative process of arteriosclerosis or atherosclerosis (a more precise name) begins in the inner part of the lining of the artery. Fats



in the form of cholesterol esters, presumably derived from the blood, accumulate inside the cells of the vessel lining. The cells containing the fats finally degenerate, releasing cholesterol, a substance that apparently irritates the vessel wall. Small hemorrhages occur, and in the inflammatory process, the layer of cells in the lining sloughs off. In time, the lesions become calcified and may occlude small vessels like the coronary or provide rough spots for blood clots or thrombi to form. These changes have been demonstrated in the arteries of young soldiers killed in Korea.

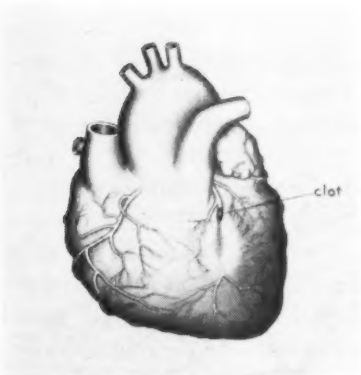
One of the first cardiac syndromes attributed to this disease process was angina pectoris, a type of pain caused by a temporarily inadequate blood supply to heart muscle.

Although nothing new about the symptoms of angina pectoris has been discovered in the past 130 years, more effective therapy is now available. Nitrites, such as amyl nitrite and nitroglycerine, help to dispel the anginal pain. More recent nitrite drugs, namely pentaerythritol tetranitrate (Peritrate), can be given over a long period of time and reduce the patient's tendency toward anginal attacks. In some instances, Peritrate is said to prevent such attacks completely.

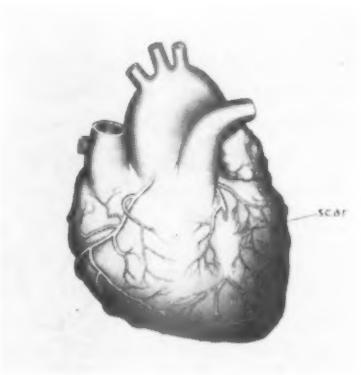
In diagnosing angina pectoris, it helps to know that changes in the electrocardiogram sometimes accompany an anginal attack. Often the examining physician uses the stress test, known also as the exercise EKG test or the Master test, to help in diagnosis. In this procedure, the patient has an EKG both before and after exercise. A tracing after exercise, showing the same characteristic changes, is highly suggestive of the coronary inadequacy that causes angina pectoris.

What happens when an area of heart muscle doesn't get an ade-

MYOCARDIAL INFARCTION



4 Days after the attack.



6 Weeks or so later.

quate blood supply to keep it alive? Once an area of the myocardium is deprived of blood by a thrombus or embolus in a vessel supplying it, it cannot function properly. The affected portion bulges out instead of contracting each time the heart beats. After a few hours, dying muscle cells are seen microscopically. And one can glimpse the scavenger white cells of the blood wandering into the area to engulf and carry away damaged heart muscle tissue.

While the damaged tissue is being disposed of, the process of repair is beginning. New fibers for scar tissue replacement grow in from the edge of the dead tissue and new capillaries branch out from unaffected vessels for substitute use. During the third week most of the debris has been carried away and the diseased portion has the appearance of a wound healing by granulation. At the end of about six weeks scar tissue has replaced the damaged heart muscle.

A person's response to myocardial infarct ranges from weakness and apprehension to sudden death. Generally, however, the infarction is followed by substernal pain radiating to the neck, lower jaw, and to one or both shoulders or arms. The pain is often more severe than that of angina pectoris and is not relieved by nitroglycerine. Blood pressure may fall sharply to the shock level, accompanied by a fall in temperature. At this time, it is not dependable to take a temperature orally. Often, there is a sensation of flatulence and indigestion. Fear of death may follow the initial attack, and a sense of strangling, without shortness of breath or respiratory obstruction, is sometimes present.

By studying EKG tracings taken over several areas of the chest, one can locate the infarction with reasonable accuracy. Systemically, the patient responds to the infarction with an increase in the number of leukocytes and an elevation of the erythrocyte sedimentation rate. A moderate leukocytosis appears within a few days and usually disappears within the same length of time; elevation of the sedimentation rate develops and recedes more slowly. Death of the myocardial tissue also releases into the blood stream an enzyme called transaminase. A significant elevation of this enzyme is found twenty-four hours after the attack and declines to a normal level in a few days. A recently developed test showing the presence of transaminase is of considerable diagnostic value.

Early complications of acute myocardial infarction help to confirm the diagnosis. Shock occurs in some 10 per cent of the cases and acute left heart failure shown by pulmonary edema may promptly follow infarction. Arrhythmias are fairly common and usually harmless, but paroxysmal tachycardia with a heart rate around 180 is a dangerous complication requiring immediate and specific treatment. Focal pericarditis may appear, but generalized pericarditis is rare. Another complication, congestive heart fail-

Col. Byron E. Pollock, M.C.

ure, may occur readily after the infarction or later when the patient resumes physical activity.

The first measures in treating myocardial infarction are injections of morphine for relief of pain, and administration of oxygen to compensate for oxygen deficiency. Oxygen may be used in all but the mildest cases. An oxygen tent which provides oxygen at the rate of about nine to ten liters a minute is the usual method of administration, but occasionally an apprehensive patient may require a face mask or face tent. The temperature of the tent is maintained for the patient's comfort, usually from 60 to 68 degrees F. Oxygen therapy may be discontinued after one to three days. To dispel apprehension, the tent may be removed for a few daytime hours, kept on at night, then permanently removed the following day.

The question of anticoagulant therapy has divided the medical

continued on page 101

GOOD nursing care is essential for patients with myocardial infarction. Much can be done to make the patient comfortable, but restrictions must not be so that they forbid minor movements. The head of the bed may be elevated and the body position changed to ensure adequate rest. Nobody recommends early ambulation in myocardial infarction but several doctors now advocate moving the patient from the bed into a chair within a few days after the onset. The armchair may be used for varying periods subject to the patient's tolerance.

Patients should not be disturbed by insistence on a bowel movement for two or three days even though there is apt to be constipation from the effect of morphine, lack of activity, and limited food intake. After the first few days, mineral oil or milk of magnesia given at night, assisted by a small saline enema in the morning, may initiate movements and prevent straining. The trend is to allow the use of a bedside commode rather than a bedpan which is now thought to overtax the patient both physically and mentally.

A cheerful restful atmosphere speeds recovery. These patients should be protected from telephone calls, and visits from tactless friends or business associates. Procedures such as EKG's, leukocyte and differential cell counts, sedimentation rate determinations, and prothrombin tests should be scheduled so as not to interfere with necessary rest. X-ray studies can often be de-

ferred until there is some improvement in the patient's condition. We can probably all remember cases in which efforts to help a patient so disturbed him that they probably did him more harm than good.

The patient who recovers from his infarction, who feels well after two or three months, naturally wants to know how much he can do. At this stage, we cannot give him a definite answer. We can only point out certain symptoms that mean "slow down." One of these is tightness in the chest; others are shortness of breath and fatigue. Of course, those with delayed complications of congestive failure or angina on exertion will have to limit their activities. It is encouraging to note, though, that those who do not have severe complications make a much better recovery if they are allowed to do suitable work. Well over 50 per cent of persons who have a myocardial infarction recover from the acute attack and go on to perform useful work. »»

"No matter how wealthy, no matter how dignified, no matter how important the patient is, he is helpless, and afraid, and you are the most important person in the world at that moment."

—Louis F. Sandock, M.D.

For the first day or two the diet consists of liquids in order to prevent distention. A good thing to remember is that cool tap water is better tolerated at this stage than ice water which may prove to be too much of a shock. The liquid diet is followed by a diet of restricted caloric content, low in fat and cholesterol. Preferably, the diet is divided into small feedings given about five times a day. Overfeeding should be avoided, particularly if the patient is obese. Coffee, in small quantities, is allowed if it doesn't cause restlessness. Alcohol is also permitted in moderation if there are no contraindications. Tobacco, however, should be banned during the acute illness and probably thereafter.

Physical activity during the recovery period is governed by the progress of the individual patient. Usually, some physical activity is allowed after the third week when scar tissue begins to replace the diseased area of the heart. At the end of three or four weeks patients may leave the hospital to continue their convalescence at home.

Maj. Dorothy Kraftschenck, ANC

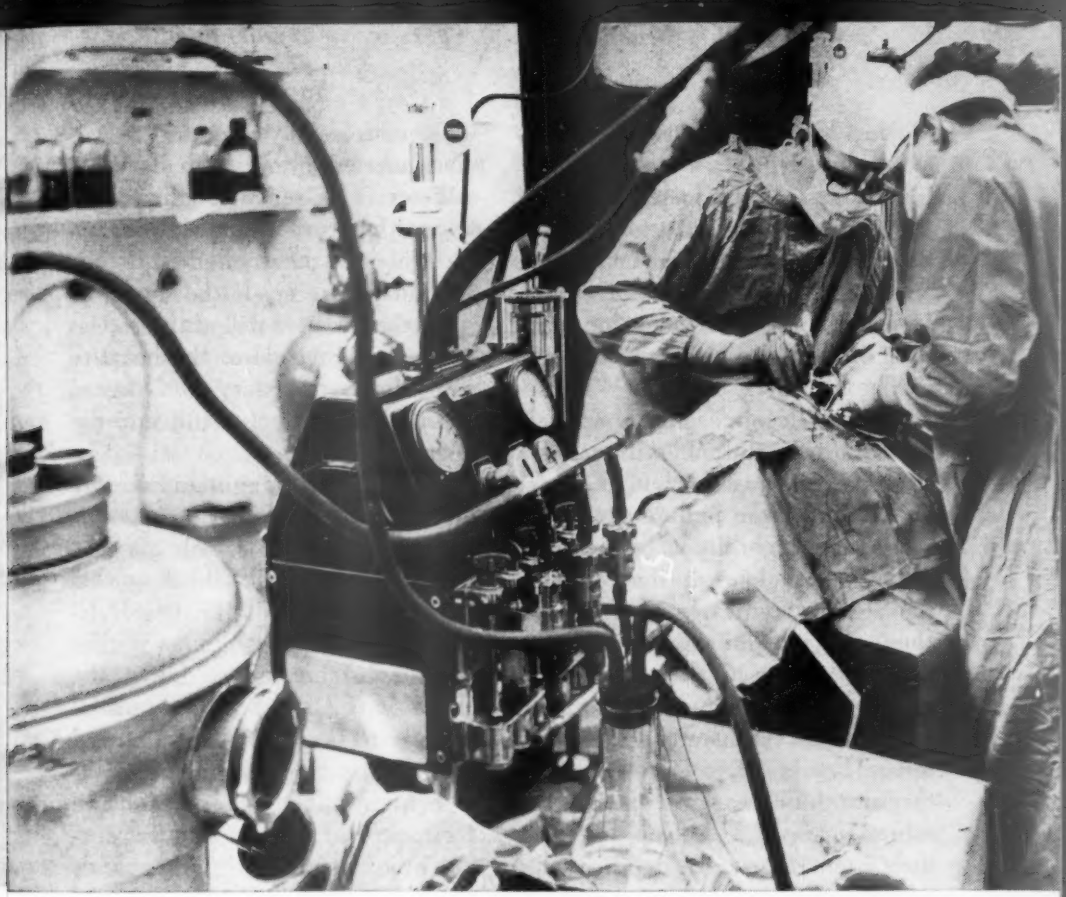
Congenital Heart Conditions Amenable to Surgery

by S. Gilbert Blount, Jr., M.D.

SOME twenty years ago, congenital heart disease was of interest to anatomists, pathologists, or embryologists. There was no reason for internists or surgeons to become interested in the subject, for there was nothing that could be done for individuals afflicted with the disease. The poor prognosis of these "medical curiosities" was inalterable.

This attitude changed in 1939 when a Boston surgeon succeeded in closing a patent ductus arteriosus. This operation stimulated interest in research, diagnosis, and new surgical techniques in the field of congenital heart disease. Today, some 90 per cent of persons with congenital cardiac anomalies (over two or three years of age) can be diagnosed solely on clinical grounds. Moreover, the majority of these patients can be helped by surgery.

Patients with congenital heart disease are now logical candidates for surgery because they have



By taking over the function of maintaining the body's blood supply, this "mechanical heart" enables surgeons to work in a bloodless field.

mechanical defects that can be corrected. After these defects have been repaired, the prognosis of the patient may be excellent. However, results are not nearly so predictable when surgery is performed to correct defects resulting from acquired heart disease for there is no guarantee that the disease process will not continue.

One of the cardiac anomalies now commonly corrected by surgery is a *patent ductus arteriosus*, a condition occurring more often in females than in males. This tubular communication between the aorta and the pulmonary artery is normally found in the fetus where it allows blood to flow from the pulmonary artery to the aorta, bypassing the lungs. With the first breath, there is a decrease in the resistance to the flow of blood into the pulmonary artery and a rise in the pressure in the systemic circuit, resulting in a reversal of flow. When this communication shunt does not close spontaneously in the first week fol-

lowing birth, the normal hemodynamics of the circulation is altered.

In diagnosing a suspected patent ductus arteriosus, four diagnostic aids are used: (1) the patient's history; (2) the physical examination; (3) the electrocardiograph; and (4) fluoroscopy.

The history is of minor diagnostic worth despite some characteristic findings. Infants with cardiac defects resulting in left to right shunts and large pulmonary blood flows are generally small, poorly nourished, and susceptible to upper and lower respiratory infections; they are not, however, cyanotic. Unless there is an unusually large defect, however, the heart adapts to the abnormal hemodynamic pattern. They begin to gain weight at three or four years of age and in school are able to keep up with their companions. The defect is generally picked up during a routine school examination.

Far more revealing than the history is the physical examination. The classic finding is a continuous machinery-like murmur heard over the pulmonary area. The murmur reflects the continuous flow of blood from the aorta to the pulmonary artery.

While a patent ductus can almost always be detected by the presence of this machinery-like murmur, there are a few instances in which the murmur is not apparent. This occurs when high pressure in the pulmonary artery eliminates the flow of blood that gives rise to the murmur. In doubtful cases like these, we sometimes have to resort to cardiac catheterization. A small rubber catheter is passed through a large vein in the arm into the right chambers of the heart and into the pulmonary artery. If the ductus is open, the catheter will at times pass from the right side of the heart to the pulmonary artery and thence into the patent ductus and into the aorta.

Another ancillary diagnostic measure that may be employed is angiocardiography which may be helpful in establishing the diagnosis of certain congenital cardiac defects. In this procedure, a radiopaque substance injected into the circulation allows the abnormal pathway to be visualized by x-ray.

The electrocardiograph is of little help in the diagnosis, for the electrocardiogram is usually normal. Fluoroscopy, on the other hand,

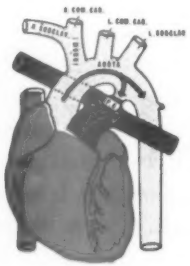


Fig. A. Relation of ductus arteriosus to great vessels.

reveals increased vascularity of the lungs from an increased amount of pulmonary blood and, more important, an enlargement of the aorta with an increase in the pulsations of these vessels.

Before the advent of cardiac surgery and antimicrobial agents, persons with a patent ductus had an average life expectancy of about 35 years. Death was caused by congestive failure due to increased work of the heart, and subacute endarteritis, an infection of the duct similar to endocarditis.

Almost all physicians now agree that the diagnosis of a patent ductus is the indication for surgery. The operative risk is small—only one per cent—and after the defect is corrected, the heart is considered entirely normal.

The optimal time for surgery is between five and ten years of age.

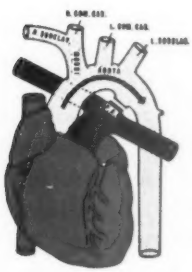


Fig. B. Ductus arteriosus severed and sutured.

If the operation is performed during this period, children, who tend to be small, still have their rapid growth period ahead and may assume a normal growth pattern after establishment of normal circulation. Surgery at these early ages permits the heart, which may have enlarged from overwork, to grow at a normal pace and for the body to "catch up" with the heart.

It has been observed that a normal nine-year-old boy may be a full head taller and weigh twenty-five pounds more than his twin brother with a patent ductus. About three years after successful surgery, however, the latter may attain the same weight and growth as his brother.

There are two variations in the operation for patent ductus arteriosus. Some surgeons believe in cutting the ductus; others ligate it with sutures. Cutting is often preferred because the first ligation operations were performed in such a manner that the ductus reopened after surgery. (Fig. B)

As in all cardiac surgery, the postoperative nursing care of a patient with this defect is extremely important. In addition to watching the general appearance of the patient, a sudden rapid rise in pulse rate with a rapid fall in blood pressure, or any sign that might indicate hemorrhage, must be quickly evaluated by the nurse. The nurse must also check the chest tubes and the bottle of the drainage set that is used to collect blood and secretions from the chest. Notations made on a piece of tape attached to the

Coarctation of the Aorta

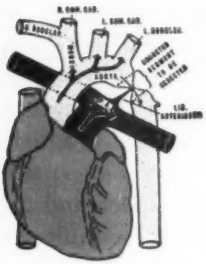


Fig. A

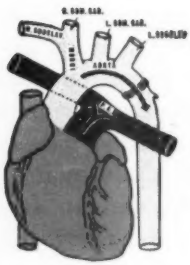


Fig. B

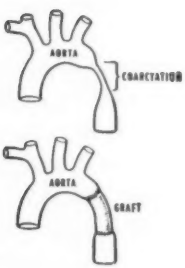


Fig. C

bottle show the amount of drainage over a certain period of time. It is also important to see that the bubble in the glass rod connected to the patient's chest tube is fluctuating. If it is not, blood may be accumulating in the thoracic cavity.

Patients are made comfortable postoperatively with analgesics and narcotics. They should not, however, be so heavily medicated that they are unable to cough or to turn. Despite strenuous objections, they must be moved from side to side every one or two hours to avoid complications of pneumonia and atelectasis. At regular intervals, they must be urged to cough and raise secretions collecting in the lungs.

A certain degree of tachycardia is understandable in patients undergoing this type of surgery. As high a rate as 150 is not too disturbing in a small child but it might indicate a dangerous arrhythmia in an adult. All high pulse rates should be reported to the doctor and observed carefully to detect regularity or irregularity. Rapid action in a heart that is already laboring because of the operative procedure may lead to heart failure.

(Fig. A) The second cardiac anomaly, *coarctation of the aorta*, is a common congenital lesion, seen more often in males than in females. Many times these males are vigorous, athletic individuals with well-developed chests, and arms. Of all congenital defects, coarctation of the aorta eluded examiners of draftees during World War II most readily and, as a result, many men

with the anomaly entered various branches of the armed service.

Actually, diagnosis of this condition, which may vary from a partial narrowing of a large portion of the aortic arch to a severe localized constriction, is simple. The main thing to remember is that these patients have high blood pressure in their arms and low pressure in their legs. (Normally, the pressure is higher in the legs than in the arms.) The abnormal pressures are caused by the aortic constriction which acts like a dam in a stream. Above the dam, the water pressure is high; below it, the pressure is low. The low pressure in patients with a coarctation of the aorta is revealed by decreased or absent pulsations in the femoral arteries.

Because blood is dammed back by the coarctation, it may result in the development of other channels in an attempt to pass around the aortic barrier. If a person with this defect straddles a chair and leans over the back of the chair, one can often see collateral or auxiliary vessels pulsing in his back.

Diagnostically, the EKG is of little importance, but x-ray and fluoroscopy are sometime responsible for detecting a coarctation. This is because the tortuous and pulsating collateral vessels cause pressure erosion of the ribs, and frequently a routine chest x-ray or fluoroscopic view reveals a characteristic notching of the under surface of the ribs resulting from the erosion. Sometimes a doubtful diagnosis in a young infant is clarified by the introduction of a radiopaque agent into the aorta; this technique is called a retrograde aortagram.

Surgery for coarctation of the aorta was first performed in 1944. This operation consists of cutting out the narrowed area and anastomosing the two severed ends of the vessel. (Fig. B) Occasionally, a graft may be employed to bridge the gap. (Fig. C)

The risk of surgery is higher than in a patient with a patent ductus arteriosus, but the results—a greatly increased life span—are worth the risk. Surgery is strongly advised for children between eight and twelve years of age, since the defect leads to hypertension and heart failure later in life. The lower limit of eight years is mentioned because by this time the child has usually developed an adequate collateral circulation and an aorta of adequate size. However, smaller children showing symptoms of heart failure or severe hypertension have withstood the surgical procedure, and operation may be indicated at an earlier age.

On the other hand, patients in their twenties or older present a surgical problem, for the arteriosclerotic changes in their aortas make the vessels friable and greatly increase the technical problems. Because of the early appearance of these changes, a patient of 25 years is considered old for this operation. That is why all aspects must be considered before subjecting older coarctation patients to the risk of surgery. [*Turn the page*]

Tetralogy of Fallot

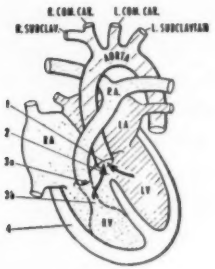


Fig. A

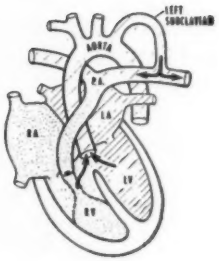


Fig. B

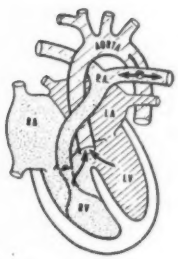


Fig. C

The alternative to surgery is not encouraging. If their congenital anomaly is not corrected, patients usually die of congestive heart failure, subacute bacterial endocarditis or endarteritis, rupture of the aorta, or a cerebrovascular accident from hypertension.

One of the hopeless congenital anomalies of the heart prior to cardiac surgery was the tetralogy of Fallot which terminated patients' lives usually by the age of 12. The Blalock operation, devised by Dr. Alfred Blalock and Dr. Helen Taussig of Johns Hopkins and first performed in 1944, considerably brightened the prognosis of these patients.

The tetralogy of Fallot refers to the four defects (Fig. A) described in 1888 by a Frenchman named Fallot. The defects include: (1) an opening in the wall or septum between the two ventricles; (2) a stenosis of the pulmonic valve cusps or narrowing of the portion below the valve which obstructs the flow of blood from the right ventricle to the pulmonary artery; (3) hypertrophy of the right ventricle resulting from the stenosis; and (4) an "overriding" aorta which results in the aorta communicating with both the right and left ventricles. The two main defects are the defect in the aortic septum and the pulmonary stenosis; actually it is these two defects that determine the clinical picture.

In patients with this anomaly, blood is obstructed in its normal flow from the right ventricle into

the pulmonary artery and lungs. If the obstruction is severe enough, the pressure of backed-up blood will become greater in the right ventricle than in the left, and blood will flow from the right ventricle into the left ventricle and aorta through the abnormal opening. The unoxygenated blood will then be pumped out through the aorta into the systemic circulation, giving the skin a characteristic cyanotic hue.

From a diagnostic standpoint, the history of these patients is significant. Cyanosis frequently appears when the child begins to walk, although it may appear earlier. A secondary polycythemia develops in these patients and they have injections of the ocular conjunctiva. There is also a mulberry hue to the mucosa of the mouth and pharynx.

The squatting position assumed by these children at times of exertion is one of the features of the tetralogy of Fallot. Often these thin children with their marked cyanosis look like sad little monkeys as they squat in a chair with their knees up under their chin. At about 12 or 13 years, however, they abandon the squatting position, either because they find it to be a somewhat embarrassing position or because they develop a collateral circulation to their lungs.

Frequently, these patients have episodes of paroxysmal dyspnea for no apparent reason. Suddenly they begin to breathe much faster and there is a deepening of their cyanosis. There may be a transient loss of consciousness or a longer period of unconsciousness with convulsions. These episodes of hypoxia, or lack of adequate oxygenation, are characteristic of a decreased pulmonary blood flow.

Another significant finding is that these children have good and bad days. One day they can walk three or four blocks without too much difficulty. Another day they are unable to walk half a block. Also, they do not do well in extremes of weather.

The physical examination reveals cyanosis, clubbing of the fingers, and a loud systolic murmur over the precordium of maximum intensity in the fourth intercostal space at the left sternal border. The electrocardiogram reveals hypertrophy of the right ventricle, and fluoroscopy shows a decrease in the vascularity of the lungs.

Cardiac catheterization is at times employed in the diagnosis of the tetralogy of Fallot. A catheter which is introduced into the right heart and then into the pulmonary artery is attached to a pressure manometer. The pressure above the obstruction, caused by the pulmonary stenosis, will be very low, but below it, pressure will rise abruptly to a high level.

Another diagnostic aid is angiocardiography. A contrast medium is injected into a vein, and as blood carries this to the heart, films are taken at rapid intervals, outlining the various chambers of the heart.

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Nursing Care In Cardiac Surgery

Capt. Margaret Wendland ANC

As heart operations become more and more frequent, surgeons and patients alike expect nursing care to keep pace with the advances in cardiac surgery. Moreover, we ourselves have a professional responsibility to cooperate in saving and rehabilitating the lives of "cardiac cripples."

To achieve this, we must first be familiar with the fundamentals that apply to all kinds of postoperative care. These involve careful observation of temperature, pulse, respirations, blood pressure, drainage, intake and output, evidences of hemorrhage, and so on. In addition, we need a knowledge of the pathology, diagnosis, and treatment of cardiac conditions requiring surgery, and an understanding of specific nursing procedures and equipment.

It's well to remember, too, that we're concerned with the patient as a whole, not merely with an operative area. We're caring for the heart figuratively as well as literally. The psychological aspect of cardiac nursing is particularly important—for many patients, especially those invalided for a long time, have emotional conflicts. Preoperative fears are often intensified by the fact that operations on the heart are relatively rare compared with most kinds of surgery. Thus, having no one to compare notes with, the patient may feel very much alone and apprehensive.

Preparation for cardiac surgery is no mere assembly-line procedure. On admission, the patient needs an atmosphere that is quiet and cheerful. His questions should be answered truthfully, without reference to anything that might be emotionally upsetting. Lay terms, rather than scientific jawbreakers, are called for in explaining what he needs to know.

Although surgeons as a rule make sure that patients understand their condition and the factors that necessitate surgery, they still have many unanswered questions when they enter the hospital. One of the best times to talk with a patient is

while he is being "prepped." In addition to answering his questions, we can tell him about some of the things to expect when he comes out of anesthesia. Patients often say later that they could have cooperated better had they been told beforehand about postoperative procedures.

In thus orienting the patient, we can mention the following facts:

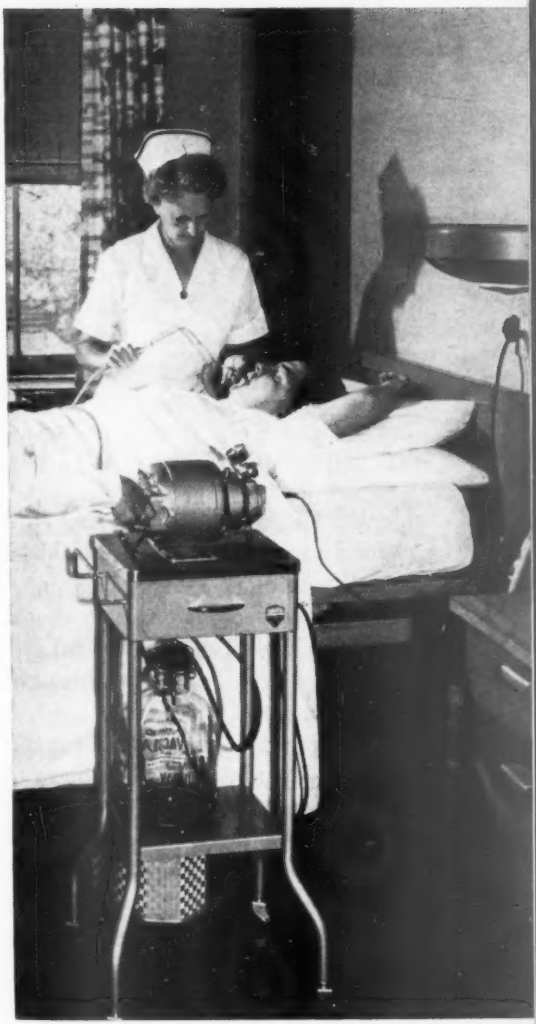
▶ When he wakes up, he will be in an oxygen tent. (Because most people think of oxygen therapy as a drastic procedure, he should also be told that being in a tent won't mean he has had surgical complications.)

▶ Despite a great deal of discomfort and pain, he will be expected to cough every hour in order to expand the lungs and bring up material from the chest; and he mustn't be at all alarmed if this expectorated material is frequently bloody. (It is a good idea to introduce him to the coughing procedure by means of a "practice run.")

▶ During the operation, chest tubes will be inserted to help carry off secretions. These tubes will not be removed for three or four days.

▶ Exercises, including deep-breathing therapy, will be part of the postoperative routine. These will be done under the guidance of a physiotherapist, who will explain them at the time.

The postoperative unit is prepared while the patient is in the operating room. In readying it, the important thing to remember is this: All equipment must be easily accessible, so the patient won't be left unattended for any length of time. Essential items are: an oxygen tent with a humidifying Mistogen unit; chest suction apparatus; a portable suction machine to suction mouth, nose, and trachea; a curved Kelly clamp; a supply of No. 22 needles; alcohol sponges for clearing chest tubes; and two shock



A Gomco unit in use.

blocks. Close by, in case they are needed in a hurry, there should be a tracheotomy set, sterile dressings, emergency medications for shock, and gastric suction equipment.

As soon as the patient is brought back from the O.R. he is placed in the oxygen tent, with the oxygen flow set at about twelve liters a minute. A bottle of Mistogen attached to a nasal oxygen outlet sprays a fluid that helps him cough and prevents sore throat. As a rule, the tent stays on only four to five hours; it usually has been removed by the time the patient is ready to be coughed hourly.

Blood pressure, pulse, and respirations are checked at least every fifteen minutes until they are stabilized—even, if need be, after the patient has completely regained consciousness. Thereafter, they're noted every half-hour, and later every hour.

One of the signs to be observed carefully is color. The degree of cyanosis is indicated by the color of the nail beds and ear lobes. Patients who have had the "deep freeze" treatment (hypothermia) tend to be duskier than those who have received ordinary anesthesia, since it takes longer for their circulation to return to normal. A hypothermia patient's temperature has usually risen to about 95 degrees F. by the time he is back from surgery; it becomes normal in about two hours. Extra blankets and hot water bottles are often used for such patients. A special rectal thermometer, connected directly to an indicator at the foot of the bed, enables the nurse to read the temperature at a glance.

In cardiac surgery, two drainage tubes are usually inserted in the chest. These may be attached either to two separate drainage bottles or —by means of a Y-shaped connector—to a single bottle. Postoperative orders determine whether gravity drainage or machine suctioning is to be used. If the latter is specified, hookup must be made to a bronchial suction machine (such as a Gomco unit) with a suction line connected to each drainage bottle. Incidentally, the Gomco unit provides both high-speed and low-speed suctioning; usually low speed is adequate for chest drainage.

When the patient is wheeled in from surgery, the drainage bottles are immediately placed on the floor, and the Kelly clamps on the tubing are removed. The nurse then marks the drainage level in each bottle with a notation of "O.R." Every

hour thereafter, subsequent levels are marked so that the amount of drainage can be calculated. Anything over two inches of drainage in an hour is usually reason for concern. (One inch = 500 cc. in a 4,000 cc. bottle.)

One of our important postoperative duties is to be sure the airway is open and that there is a good respiratory exchange. Once the patient is thoroughly awake, he must be made to cough every hour from a sitting position. To provide support and make the coughing less painful, the nurse stands at his right and places her hands on his chest with one hand pressing against the incision on his left side. The patient then coughs ten to twelve times. Generally, coughing is not productive until the procedure is repeated a few times. The expectorated material is bloody mucus.

If a patient won't cooperate or can't bring up mucus, the nurse may have to resort to the use of a Cof-flator, a box-like machine which creates enough pressure to raise the mucus, and which may be used five or six times a day for five to ten minutes at a time. Designed for similar use, the IPB machine (or interpulmonic breathing apparatus) utilizes oxygen, and therefore must be connected to an oxygen tank.

Patients must be turned as well as coughed. They may be turned to either side, but usually the right side is preferred. Since the patient doesn't remain on this side for more than an hour, drainage is not affected; and when he's turned back, the fluids drain off. Lying on the operative side may kink the chest tubes and cause considerable discomfort. These tubes, though soft to the touch, can be very painful when they're rubbing up and down inside the chest cavity.

One complication that may occur during drainage is plugging of the chest tube. Fortunately, this clotted material can now be liquefied by Varidase, an enzyme preparation of streptokinase and streptodornase mixed with saline. The plugged tube is first clamped off and the area cleaned with alcohol. The solution is then injected into the tube, and the Kelly clamp is left in place for about four hours. For the first twenty minutes, the patient is put in a Trendelenburg position to allow the enzyme to pass into the chest cavity. When the Kelly clamp is removed, the Gomco suction is turned on to draw off the material.

While the enzyme is doing its work in the chest cavity, the patient runs a fairly high temperature. (During this feverish four-hour period, patients may be made comfortable with alcohol sponges, cool towels, and aspirin.) Usually the doctor injects the enzyme on the basis of the patient's chest film and chest sounds. The nurse, however, may facilitate the flow of clotted material by inserting a No. 22 needle into the tube. This allows air to en-

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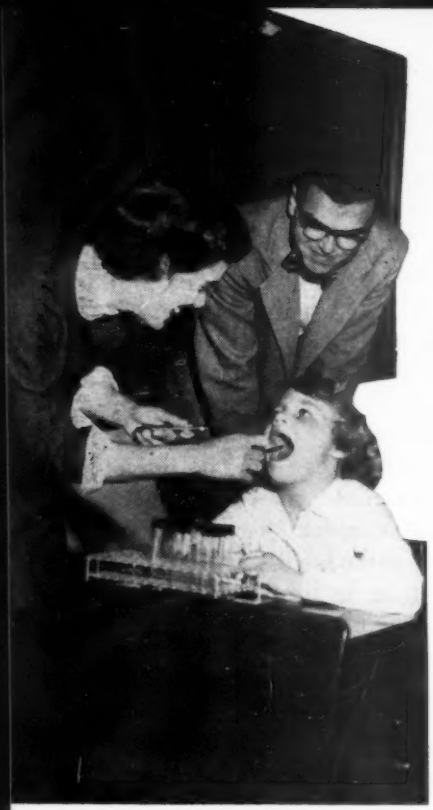


Problems of Acute Rheumatic Fever and Rheumatic Carditis

by John Lichty, M.D.

Wide recognition of the part that strep throats play in this childhood affliction should ultimately reduce its incidence.

WE'RE still in the dark as to the exact cause of rheumatic fever —dread forerunner of heart disease. Hypersensitivity probably has something to do with this childhood scourge, but at present we're not sure of its etiological role. Almost everyone agrees, however, that a streptococcal infection triggers a rheumatic bout in susceptible individuals.

Some believe that heredity predisposes the child to rheumatic fever. They claim that susceptibility to the illness can be inherited in the same way the color of the eyes and the color of the hair are inherited. While this theory does not meet with the approval of everyone, it is a generally accepted fact that rheumatic fever is likely to affect several members of the same family. It also occurs most often in persons exposed to a poor social and economic environment—those who can least afford to pay for ex-

pensive drugs and medical care.

Although it is almost impossible to do anything about the hypersensitivity and hereditary factors supposed to be involved in rheumatic fever, we're not completely without therapeutic weapons. We can do something about streptococcal infections and poor living conditions.

To understand current methods of combating rheumatic fever, let's see what happens to an individual who is destined to become a "rheumatic."

The first event in the rheumatic sequence is usually a streptococcal infection—sore throat, tonsillitis, or whatever you choose to call it. This may be sufficiently serious to require medical care, or it may pass unnoticed. After a latent period of days or weeks, rheumatic fever with its symptoms of polyarthritis—painful, swollen joints—appears. But again, the disease may occur in such a mild form that it goes unrecognized. And just as the rheumatic disease may be inapparent so also may be cardiac involvement.

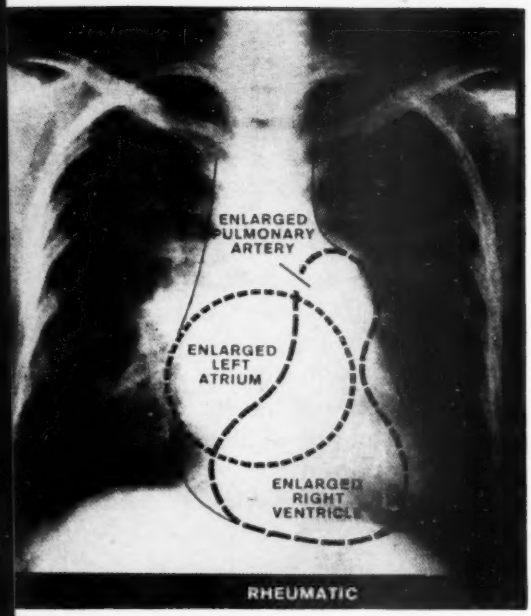
After weeks or months the disease process usually subsides, even if the patient has not been treated. But no immunity is conferred by rheumatic fever. Sooner or later the patient succumbs to another streptococcal illness; and this time, the rheumatic process may lead to more cardiac damage, involving the pericardium, heart muscle (myocardium), or valves. The mitral and aortic valves are most commonly involved, with stenosis or insufficiency resulting from the disease process.

Unfortunately, there are no tests to determine whether a child will be a rheumatic. The so-called susceptible individual cannot be singled out until he has a "clinical" or diagnosed case of rheumatic fever. However, once such a person is discovered, we can help to keep him from becoming a cardiac cripple.

In order to prevent a second dangerous attack of the disease, the rheumatic child or adult should be given some form of continuous drug prophylaxis, such as sulfa pills daily or a monthly injection of penicillin. At present, a rheumatic child is advised to follow the prescribed regimen for the rest of his life.

Just what drug is most effective in preventing the disease is controversial. Some believe sulfadiazine is a good prophylactic—it's inexpensive, easy to take by mouth, and has been used with a high degree of success. Others hold that penicillin is superior to sulfadiazine.

Rather than defend the exclusive use of either penicillin or sulfadiazine, we have worked out a compromise in treating our rheumatic patients at the university hospitals in Denver. During an acute attack of rheumatic fever, we give the child penicillin to get rid of the streptococcus; but after the acute episode, he is put on a continuous daily dosage of sulfadiazine. If he gets a sore throat in spite of this, we prescribe long-acting penicillin



RHEUMATIC

and tell him to continue the sulfa. It's well known that sulfadiazine is not nearly so effective as penicillin in treating a sore throat. This is probably because penicillin is streptococcicidal; that is, it actually kills the streptococci, while sulfadiazine only suppresses their growth.

We'll have to admit that many doctors are passing up the chance of preventing rheumatic fever by not prescribing the adequate treatment for sore throats. Maybe we ought to take more throat cultures from patients with sore throats, and also find out if other members of the family have the same affliction.

So much for preventing and curing streptococcal disease. Another matter we're concerned about is avoiding a false diagnosis of rheumatic fever. Because there is no specific diagnostic skin or blood test, certain criteria, set up for diagnostic purposes, are divided into a major group and a minor group. Major criteria include carditis, polyarthritis with redness, swelling, and tenderness of the joints, chorea, subcutaneous nodules, and a "smoke-ring" form of erythema called erythema marginatum. In the minor group are fever, arthralgia, electrocardiographic changes, and certain laboratory evidence. Unless the patient has two of these major manifestations, or one of the major group and two of the minor group, he is not considered to have rheumatic fever. Incidentally, it's not fair to use arthralgia as one of the minor signs if polyarthritis is a major one.

The other matter rheumatic fever specialists are concerned about is the false diagnosis of heart murmurs. Representative samplings of some 11,000 school children in Colorado showed that over a third of these children had what is called a functional or innocent murmur. This harmless type of murmur may be confused with an organic murmur of rheumatic heart disease. To help the family physician distinguish between a functional and an organic murmur, the Colorado Heart Association supports a special diagnostic clinic where patients are examined by several cardiologists and undergo special tests to detect evidence of rheumatic fever and heart disease.

So far there is no specific treatment for rheumatic fever. Aspirin has been used for a long time, and some physicians believe it works remarkably well. Others say all it does is make the patient comfortable. When cortisone and ACTH appeared a few years back, everyone thought these drugs were the answer. But a large-scale cooperative study in this country and England, involving the use of aspirin, ACTH, and cortisone, failed to show that either of the two hormones had any marked advantage over large doses of aspirin.

The study, which was conducted in 1950 and 1951, has been criticized by specialists who say that the important thing in hormone therapy is to individualize the dose of the hormones on the basis of the patient's weight. Also, in contrast to a six-week dosage limit used in the study, dosage is now continued according to the individual's period of convalescence. Whatever their relative degree of effectiveness, however, neither these hormones nor aspirin completely solve the problem of treating the child with acute rheumatic fever.

The subject of bedrest—a traditional part of rheumatic fever therapy—has received considerable discussion recently. On the basis of the literature and correspondence with many cardiac centers, it's probably safe to say that the experts are swinging away from the idea of absolute bedrest, at least for children not desperately ill. They believe that "chaining" the child to the bed doesn't help his heart; certainly it doesn't help his spirit. For the best results, we have to figure out how to get the child to rest without forcing him to stay in bed.

In feeding rheumatic children, it's best to let them select their own foods, within reason. We don't care what they eat provided they like it —the only exception being salt, which is usually reduced in the diet for children with heart failure.

Oxygen is still a requisite for the desperately ill rheumatic patient; and if good nursing care doesn't quiet the child, there's no reason why sedative drugs can't be used. Among the more specific drugs administered to the seriously ill are the mercurial diuretics and the digitalis drugs. The type of digitalis prescribed depends upon the physician's preference. There has been some controversy over whether digitalis harms the heart muscle of patients with acute myocarditis. However, the latest findings indicate that the digitalis drugs are less toxic in this condition when there is an adequate potassium intake.

One of the most difficult problems is deciding when the rheumatic process has ended and when the convalescent program can be stepped up. Some doctors base their decision on lowered sedimentation rates; others go by an increase of hemoglobin and weight.

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Hypertensive Cardiovascular Conditions

by Rollen Wayne Moody, M.D.

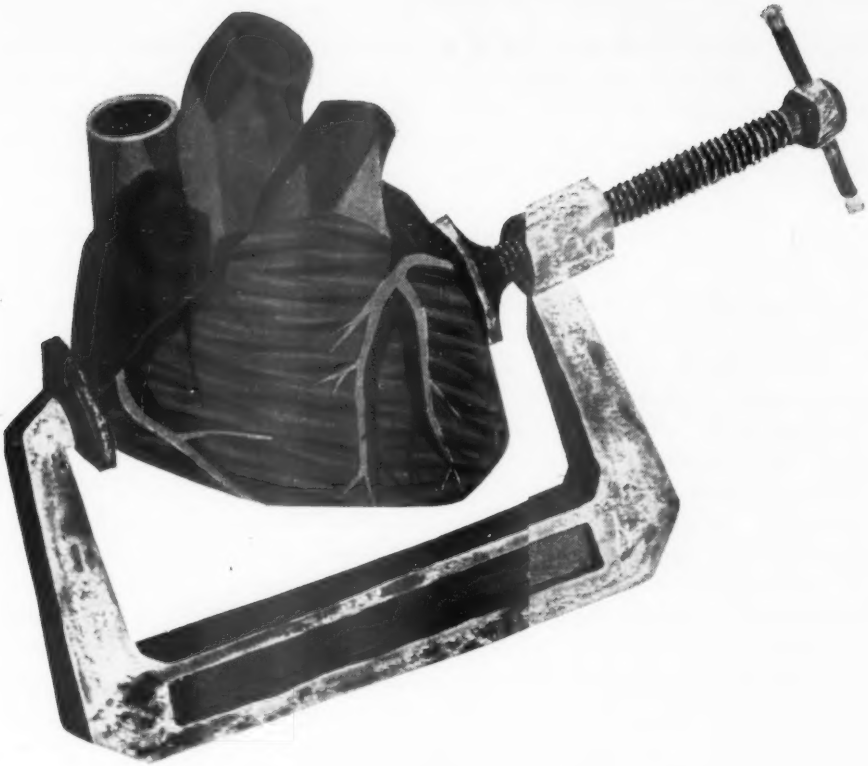
ALTHOUGH little is known about the cause of hypertension, the fact that it appears most often among civilized peoples of the Western world leads researchers to believe that environmental factors of stress, strain, and diet play an important etiological role. This belief is strengthened by the finding that natives of hypertension-free countries become prone to the disease when they live in the U.S.

Heredity may be another contributing cause. If one parent is hypertensive, a child's chances of becoming hypertensive are about 40 per cent. If both parents are hypertensive, the chances are about 90 per cent.

It has been noted, too, that hypertension is more apt to occur in stocky, dynamic, and aggressive persons. Although the disease is more common in women, it is generally less severe than in men who are more likely to develop arteriosclerosis. To some extent, obesity may predispose to hypertension.

In a few patients, more definite causes may be discovered and frequently cured. In some there is no specific cause. For example, it is entirely normal for some persons to have a slight elevation of blood pressure over a period of years. If not accompanied by complications, there is little cause for worry.

Then there is hypertension



caused by cranial lesions such as tumors which increase intercranial pressure. In these cases, of course, the signs clearly indicate the presence of a neurological lesion.

A third type of high blood pressure, attributed to disorders of the endocrine glands, is associated with acromegaly, adenoma of the pituitary gland, adenoma of the adrenal cortex, and the menopause. Another endocrinal disease, pheochromocytoma, a tumor of the adrenal gland, may be responsible for a paroxysmal type of hypertension marked by sweating, dizziness, nausea and vomiting; epigastric pains, palpitation of the heart, and rapid pulse may be noted, as well as elevation of blood pressure. Two-thirds of these tumors, however, give rise to symptoms resembling essential hypertension, and must be distinguished from this disease diagnostically.

Every young person with hypertension should be tested for the presence of pheochromocytoma. Such tests employ Benzodioxane and Regitine if the blood pressure is high, because these drugs neutralize the excessive adrenalin produced by this tumor and therefore reduce blood pressure. Histamine tests are reserved for periods when the blood pressure is low, since histamine stimulates the adrenal gland to produce adrenalin and conse-

quently raises blood pressure if a tumor of this type is present.

Hypertension may also result from disease or deformity of the kidneys, especially if the arterial blood supply of these organs is affected. It may be remembered that hypertension was first produced experimentally in animals when the renal artery was clamped off.

Chronic kidney diseases, such as glomerular nephritis which interferes with the kidney's blood supply, also produce hypertension. (Often, chronic glomerular nephritis is bypassed by the physician because the hypertension produced is mild and the urine findings are minimal.) Pyelonephritis may cause moderately severe hypertension. And an elevated blood pressure caused by pressure on the ureters, the kidney pelvis, and the bladder can often be traced to the presence of a kidney stone.

The conditions mentioned here, however, account for only a very small percentage of hypertension. The vast majority of patients with high blood pressure do not have any demonstrable reason for their affliction, and are said to have essential hypertension, one of the most important causes of heart disease.

In essential hypertension, constricted arterioles maintain an elevated blood pressure, and the heart has to pump harder to supply the body's tissues with blood. As a result, the arteries become thicker and narrower, and eventually may rupture or close, reducing vital blood supplies to certain portions of the body. Also, cardiac failure may result from the inability of the heart to pump efficiently through the resistant arteries.

The asymptomatic phase in essential hypertension is followed by such vague symptoms as dizziness, ringing in the ears, fullness and pounding in the head, and headache; also by nervousness, irritability, and fatigue. Finally, arterial changes may damage the heart, kidneys, brain, and retina. Nearly two-thirds of such patients die of cardiac decompensation; close to a third die of cerebral complications, including cerebral accident; and a small group (5 to 8 per cent) die of renal complications. Often the kidneys are severely damaged in a rapidly fatal form of the disease called malignant hypertension.

One of the more serious syndromes associated with hypertension is hypertensive encephalopathy. Its symptoms—severe headache, loss of consciousness, loss of memory, confusion, delirium, and sometimes tension paralysis lasting for an hour or a day—are apparently due to transient edema of the brain.

The prognosis of the hypertensive patient cannot be predicted from a few examinations, but some idea can be gained from prolonged observation. Many patients live for years without any complications or difficulties, and eventually die of something else.

The basic facts that influence treatment are: (1) the disease

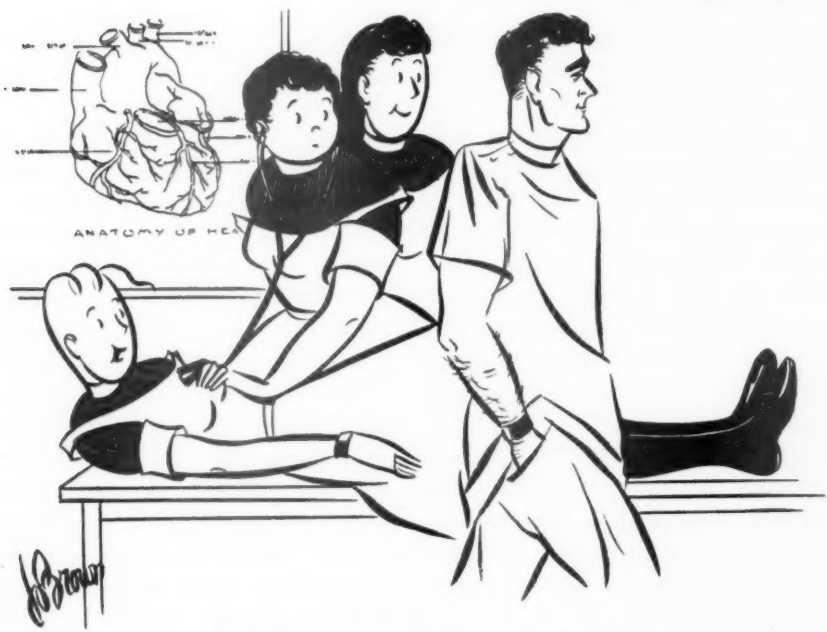
tends to be persistent and progressive; (2) most authorities agree that the reduction of pressure produces beneficial results and improves the prognosis (because of the danger of a limited blood supply, possible contraindications include chronic kidney disease, severe coronary insufficiency, a recent myocardial infarction, and previous serious cerebrovascular complications); (3) the constricted arteries are capable of being dilated when quite sclerotic; (4) a reasonable reduction of pressure has not been shown to cause nutritional disturbances of tissues.

The first objective of treatment is to do everything possible to assure the patient's peace of mind; the second is to relieve the vasoconstriction by reducing arterial pressure.

Using the psychotherapeutic approach to essential hypertension, we advise the removal of stresses and strains, the avoidance of emotional upsets and conflicts; and adherence to a regular schedule without too much responsibility or overwork.

Vacations and naps are useful, but prolonged periods of rest, except for imminent stroke or heart failure, accomplish only temporary results. As soon as the patient discontinues resting, the blood pressure reverts to its previous high

PROBIE



"WHENEVER HE PASSES—I FIBRILLATE."

level. Reduction of weight is important; obesity is not a cause of high blood pressure but does aggravate it. The diets effective in hypertension have one thing in common—the restriction of sodium. However, in the summer when the body loses a lot of salt, care must be taken not to limit the sodium intake too much.

Some of the "stand-by" drugs continue to be used in the treatment of hypertension: the barbiturates for their calming effect, and the nitrites—mannitol hexanitrate and erythrityl tetranitrate—for their vasodilating effect. The thiocyanates, extremely toxic drugs, may lower blood pressure but may prove to be more dangerous than the disease.

With newer drugs, we can now lower the blood pressure of almost any patient. The systolic level to be desired is 150 to 180; the diastolic, 90 to 110. Since mild drugs will reduce pressure in 95 per cent of the cases, these are tried first.

One mild, moderately effective drug—the widely publicized rauwolfia derivatives—may be used alone or in conjunction with more potent drugs. It takes from one to three weeks for this drug to reach its height of effectiveness and equally as long for its effects to vanish entirely after discontinuance. Minor toxic effects are nasal stuffiness, nightmares, and edema. The bothersome nighttime symptoms may be allayed by eliminating the evening dosage.

Another antihypertensive agent, veratrum viride, hasn't lived up to its expectations. The difference between an effective dose and a toxic dose is practically nil; hence, toxic effects may precede the effect on the blood pressure. These toxic actions include severe nausea and vomiting, warmth in upper extremities, dizziness, and lethargy. However, this drug, as well as rauwolfia, may minimize certain disagreeable effects (tachycardia, palpitation, and headache) caused by another antihypertensive drug, hydralazine (Apresoline).

Hydralazine dilates the peripheral arteries by blocking epinephrine in the circulating blood. In addition to the untoward actions just noted, it may produce arthralgias that result in rheumatoid arthritis, or even in lupus erythematosus. Since it increases gastric acidity, it should not be used in the presence of a duodenal or peptic ulcer.

High on the list of antihypertensive drugs are those which reduce blood pressure by blocking the nerve ganglia of the sympathetic nervous system. Producing much the same effect as the surgical procedure of sympathectomy, these drugs block the transmission of the sympathetic impulses that control arterial tone and support the blood-pressure level.

One of these drugs, hexamethonium (Methium, Bistrium, Hexameton, Esomid), is sometimes toxic when given alone. It may produce dryness of the mouth and weakness of the bladder, may af-

fect accommodation of the eyes, and sometimes causes impotence and pulmonary fibrosis. It also decreases sweat and gastric acidity. In combination, however, hexamethonium and hydralazine seem to complement each other and decrease each other's side effects.

One such effect to be guarded against is constipation. If hexamethonium is allowed to accumulate in the bowel, there may be several, severe reactions, including dizziness and faintness. These reactions are particularly noticeable when the patient rises from a prone position, for blood pressure falls rapidly in the standing position.

Other ganglionic blocking agents are: pentolinium tartrate (Ansolysen), a more potent predictable drug, with fewer side effects; mecamylamine (Inversine), which is supposed to be completely absorbable from the gastrointestinal tract and therefore more potent and better able to produce a predictable response; and chlorisondamine (Ecolid Chloride), which is quite potent and predictable, with a longer action. Because of their predictability, mecamylamine and chlorisondamine are being used on ambulatory patients. All individuals receiving ganglionic blocking drugs should have their blood pressures taken both sitting and standing (or lying and standing) before each dose.

With the influx of new antihypertensive drugs, nurses will be required to take frequent, accurate blood pressures. Therefore, it's a good idea to review the procedure.

Systolic pressure, it may be remembered, is produced by the maximum contraction of the heart; diastolic pressure, by the closure of the aortic valve. In between these two is the pulse pressure—which is slightly higher in the larger vessels and the vessels of the legs. More constriction of the arterioles and faster pumping action of the heart raises the pulse pressure.

Previously, the patient's blood pressure was taken in a sitting or lying position. With the use of ganglionic blocking agents, it is also necessary to take it in a standing position. In any event, one should indicate the patient's position at the time his pressure is determined.

The blood pressure cuff should always be pumped up to over 200 mm. of mercury. There is a good reason for this. In hypertensive patients with systolic pressures over 200, there may be a gap in the 150 to 190 range. Thus, one might pump the cuff to 170, and obtain a systolic reading of 160 in a person whose pressure was actually 220. This gap may be detected when the mercury column is allowed to fall slowly.

It is well to know that there are normal variations in blood pressure. Pressure tends to rise during adolescence, decrease or remain the same in maturity, and increase

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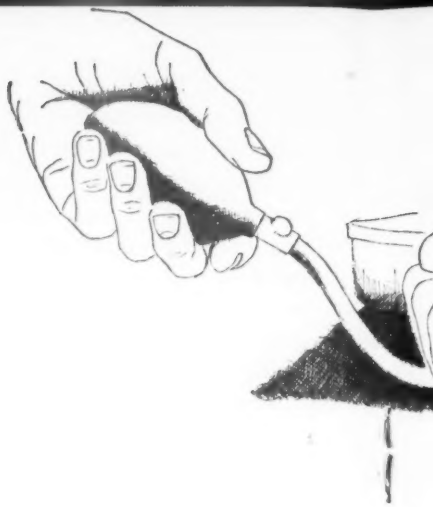
The Nurse's Contribution in the care of The Hypertensive Patient



by Susanna Chase, R.N.

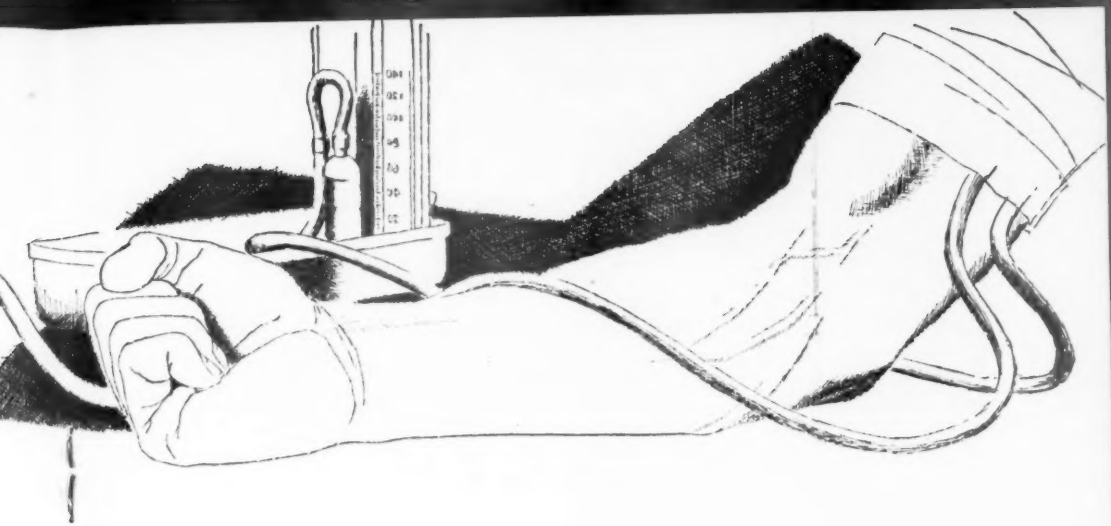
In the management of essential hypertension, the principal problem of nurses and doctors is a psychological one: How to keep the patient's emotions from causing a rise in blood pressure. Solution of this problem is obviously no simple matter; in fact, investigators have been trying for some time now to establish a definite relationship between the psychological and the physiological aspects of the disease—without yet being able to say exactly why some people and not others develop hypertension.

Most authorities believe that the aggressive, hard-driving individual is the one most likely to become hypertensive. And some suggest that emotional anxiety may be the cause of the disease—by initiating arteriosclerotic changes and increasing peripheral resistance. At any rate, anxiety is such a common finding in essential hypertension that it might be helpful for us to know more about it.

Anxiety stems from an uneasy feeling—the kind of uneasiness you are unable to do anything about. If you don't understand what is going on, you develop anxiety; if you know what is happening, you can go about your business without this uneasy feeling.

Most patients, of course, are apprehensive when hospitalized. (Little wonder, in many cases—considering all that is done to them without adequate explanation.) But the hypertensive individual is especially prone to anxiety when he doesn't understand what is being done. Imagine, for example, what goes on in his mind when a nurse takes his blood pressure every two hours without volunteering a word of explanation — and perhaps without even a greeting. Certainly such a nurse is contributing to, rather than lessening, the patient's anxiety.

In many instances, this anxiety might be lessened by an understanding nurse. If we allow a patient to explore his feelings by asking questions, and if we answer those questions with reasonable explanations, much that is mystifying



and worrying him can be made clear. If, on the other hand, we cut off his attempts to question us, his anxiety will probably be increased. All too often a nurse is evasive instead of being helpful. "This isn't a good time to talk about that," she tells the patient; or, "You'd better ask your doctor." Such replies indicate that the nurse is unsure of herself, that she doesn't recognize the patient's need to explore his feelings, or that she is covering up her own lack of knowledge.

Our aim in nursing should be the development—along with skill—of an inner feeling of ease and self-confidence based on clinical and psychological knowledge. Thus, our outward manner will encourage a tense, worried patient to relax, communicate his fears to us, and come to a better understanding of the factors that affect his condition. This is particularly important in hypertension because we want these patients to help themselves by living within certain restrictions.

Learning to live with the disease takes much longer than the time it takes a nurse to read a textbook on the subject. The kind of information the patient needs can't be dinned into him while we're giving him a bath—not if he's to be familiar with it the next day. Patience, as well as a sincere interest in the individual patient, are needed in the teaching program. People with this disease are apt to be emotionally changeable—happy one day, depressed the next; and they're constantly apprehensive about the consequences of high blood pressure. Therefore, we have to be flexible, and suppress any annoyance we may feel.

Even the seemingly simple procedure of taking blood pressures can be explained in a way that will help the patient to cooperate and will allay his anxiety. After all, the vast majority of patients are reasonably intelligent; if they know why such readings are necessary,

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Pointers on Taking Blood Pressures

by Mary A. MacRostie, R.N.

FORMERLY considered in the doctor's province, the taking of blood pressures has gradually become an accepted nursing function. In recent years, particularly, with the advent of new and potent antihypertensive drugs, nurses are finding it imperative to keep informed on all aspects of this important procedure.

Frequently overlooked, however, is that the nurse's own attitude may affect the blood pressure readings she obtains. It is not enough that she be meticulously accurate; she must avoid any mannerism that might affect the patient's emotions and increase his blood pressure. A calm, unhurried, and confident manner accomplishes the best results.

Often disregarded, too, are the patient's activities just prior to the reading. Has he been resting in bed or walking down the hall? Did he hurry from the bathroom to the bedside to have his pressure taken? Such observations, recorded by the nurse along with the blood pressure readings, can be of considerable value to the attending physician.

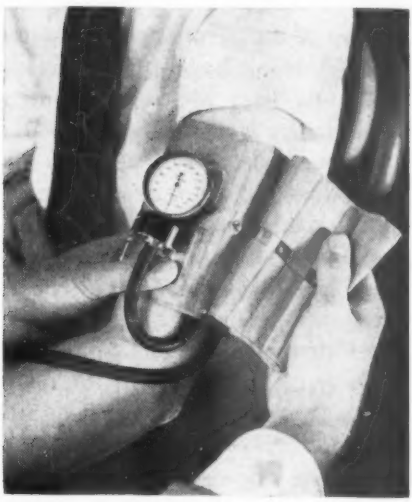
With physical exertion and emotional disturbances likely to affect any single reading, we can readily see why a series of determinations, taken at regular intervals, is necessary. From the medical viewpoint, it is the relationship between these regularly spaced readings that makes the blood pressure record significant.

Usually, blood pressure determinations on hypertensives are ordered for 8 A.M., noon, 4 P.M., and perhaps again at bedtime. The 8 A.M. reading is considered a basal blood pressure. Taken before breakfast and before activity begins, this recording is understandably lower than those taken during the day.

Initially, a reading is obtained from both arms. The left arm, however, is the one commonly used in subsequent readings. There is no appreciable difference between the two recordings, provided there are no local pathological conditions, such as tumors, arteriosclerosis, or congenital malformations.

Blood pressures may be taken with either a mercury column manometer or the aneroid (dial) type; and either the auscultatory method (with stethoscope) or the palpatory method (with palpating fingers) may be used.

Normally, readings are obtained with the patient seated comfortably or lying, and preferably with the arm bared. If he is seated, his arm —slightly flexed, abducted, and relaxed—is supported at heart level on an even surface. The hand may be in a prone or supine position, depending on which position yields the clearest sounds. The deflated bag and cuff are placed securely around the arm one inch above the antecubital space, and the stethoscope is placed firmly over the brachial artery, free from contact with the cuff. Points to remember are that the mercury column must be vertical and the meniscus should be read at eye level.



In the auscultatory method, which utilizes a stethoscope, the manometer pressure is raised rapidly until the mercury registers more than 200 mm. Hg, then decreased slowly until a sound is heard with each heart beat. The mercury level at the moment when the first sound is heard is recorded as the systolic reading; the level at which a sound can no longer be detected is, according to some authorities, the diastolic reading. Others record the diastolic pressure as the level where the clear sounds become muffled.

Often, especially when a cardiologist is in attendance, it is a good idea to record three figures. For example, 180/100-96 means: 180 systole; 100 diastole—where sounds become muffled; 96—where sounds

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QUINIDINE *Cinchona bark*

DIGITOXIN *Digitalis purpurea*

The Physiological Action of Cardiovascular Drugs

THIS portion of the cardiac symposium will attempt to show how certain useful and potent drugs alter favorably the functional imbalances that occur in the course of congestive heart failure, cardiac arrhythmias, coronary insufficiency, and hypertension.

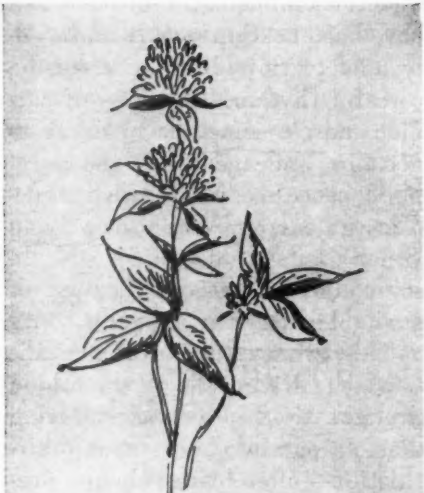
While none of the drugs now in use is capable of curing diseases of the heart and blood vessels, many can control the progress of these ailments and lengthen life expectancy. Most such drugs act specifically to counteract the effects of some abnormality in physiology.

Congestive Heart Failure

That this is the most common cardiac disturbance should not be surprising, since it is the end result of many different pathological processes. All, including congenital cardiac anomalies, valvular malformations of rheumatic origin, narrowing of the coronary vessels, and hypertension, have one thing in common: they weaken the myocardium by making it work at a mechanical disadvantage.

By drawing upon its reserves of energy, the heart muscle may manage, for a while, to pump enough blood into the blood vessels to maintain the needs of the tissues. These demands are met mainly by an increase in the size of the heart and an acceleration of its rate. Eventually, however, limits of compensation are reached, and the

RESERPINE *Rauwolfia serpentina*



DICUMORAL *Trifolium pratense*

by Morton J. Rodman, Ph.D.

handicapped heart can no longer cope with the load of blood returned to it by the great veins draining into the right auricle.

As a result, some blood remains in the ventricles after each contraction, and blood begins to back up into the venous approaches to the heart. This increased venous pressure, combined with a decrease in the filtering function of the kidney due to inadequate renal blood flow, often forces fluid out of the veins and into the surrounding tissues. Such leakage causes the fluid to accumulate in the feet, legs, and abdomen. Congestion in the lungs causes cough, cyanosis, shortness of breath, and other distressing and serious symptoms.

While little can be done to remedy the structural defect or pathological process responsible for heart failure, the more severe symptoms may be relieved and the patient's strength restored by proper medical management. Here, the basic objectives are a return to normal circulation (hemodynamics) and removal of the excess fluid.

The two types of drugs most effective in attaining these ends are cardiac stimulants, such as the digitalis glycosides, and diuretics, including the organic mercurials and other compounds that improve kidney function.

The chief value of digitalis lies in its extraordinary ability to strengthen systolic contractions;

under its influence, ventricles that have been beating weakly and wildly tend to slow down to a steady, forceful rhythm. The mass of cardiac muscle somehow manages to get more mileage out of the metabolic processes from which it derives its energy. While the way in which digitalis does this is still obscure, the increased utilization of available energy is apparent.

This primary action of digitalis —which drives all of the blood brought to the ventricles during diastole out into the systemic circulation—often brings about a dramatic reversal of the cycle of events that had led to congestion. Though digitalis does not act directly on the kidneys, its cardiac action improves their function. The increased ability of the heart to handle the venous return reverses the outward passage of fluid from the venous capillaries and draws it from the tissues. At the same time, the kidneys' ability to handle this additional fluid is enhanced by a flow of fresh oxygenated arterial blood.

Some patients, however, require drugs acting directly on the kidneys. Impairment of kidney function in cardiac failure often results in the excessive retention of sodium, chloride, and other extracellular electrolytes. Inadequate excretion of these ions causes them to be carried back into the blood, along with the water in which they are dissolved. Later, this salty fluid passes out of the engorged venous

THE CLASSIFICATIONS OF PATIENTS

Functional Capacity

CLASS I	Patients with cardiac disease but without resulting limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea or anginal pain.
CLASS II	Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea or anginal pain.
CLASS III	Patients with cardiac disease resulting in marked limitation of physical activity. They are comfortable at rest. Less than ordinary activity causes fatigue, palpitation, dyspnea or anginal pain.
CLASS IV	Patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms of cardiac insufficiency or of the anginal syndrome are present even at rest. If any physical activity is undertaken discomfort is increased.

capillaries and is trapped in the tissue spaces by osmotic forces.

The organic mercurial diuretics act by interfering with the passage of chloride ions back to the blood through the cells lining the tubules. These unabsorbed chloride ions remaining in the tubules are excreted in the urine along with sodium and large quantities of water needed to maintain osmotic equilibrium. Giving ammonium chloride prior to the mercurial diuretics often increases their effectiveness. Administration on alternate days of the new sulfonamide-derived diuretic, acetazolamide (Diamox), may also result in a more sustained diuresis.

The latter drug also decreases tubular reabsorption of electrolytes through inhibition of an enzyme, carbonic anhydrase. Here, however, it is bicarbonate rather than chloride which is kept from returning to the blood. The end result is the same in any case: large amounts of salty fluids are removed from the waterlogged tissues and excreted in the urine. The double drying action of the diuretics and digitalis, together with the latter's direct action on the heart, may dramatically control the main discomforts of cardiac failure and help to bring about complete compensation.

Cardiac Arrhythmias

While changes in the rate and rhythm of the heart beat may occur in normal hearts, such irregulari-

WITH DISEASES OF THE HEART

Therapeutic Classification

Patients with a cardiac disease whose ordinary physical activity need not be restricted.	CLASS A
Patients with cardiac disease whose ordinary physical activity need not be restricted, but who should be advised against severe or competitive physical efforts.	CLASS B
Patients with cardiac disease whose ordinary physical activity should be moderately restricted, and whose more strenous efforts should be discontinued.	CLASS C
Patients with cardiac disease whose ordinary physical activity should be markedly restricted.	CLASS D
Patients with cardiac disease who should be at complete rest, confined to bed or chair.	CLASS E

ties usually result from organic heart disease. Thus cardiac arrhythmias are often part of the clinical picture in congestive heart failure, acute rheumatic fever, and myocardial infarction.

Very few of the many chemical compounds that affect cardiac rhythm act selectively on the myocardium and conducting tissues of the heart. The most useful of these are quinidine and procaine amide hydrochloride. Both act mainly by reducing the excitability of the hyperirritable heart muscle and by depressing conduction of impulses through the auricles, ventricles, and specialized conducting tissues.

Quinidine is especially useful in auricular fibrillation, a disorder in which normal contractility of the atrial musculature is replaced by a disorganized twitching of isolated groups of muscle fibers. This is believed to result from increased excitability of hyperirritable areas that fire impulses at a rate more rapid than those originating in the sino-auricular node, the normal pacemaker of the heart. Quinidine depresses the excitability of these areas and reduces the rate at which they discharge impulses. This enables the S-A node to assume control again and bring about a normal rhythm.

In a similar manner, quinidine and procaine amide act upon the ventricular musculature to prevent and overcome ventricular tachycardia. This type of arrhythmia is especially dangerous because it may lead to fatal ventricular fibrillation, a condition in which the uncoordinated muscle fibers contract too weakly to drive blood out of the heart into the systemic circulation. By rendering the cardiac muscle more resistant to abnormal impulses arising in injured, irritable

areas of the ventricles, these "antifibrillatory" drugs tend to slow the rapid rate of the ventricular beat before it degenerates into a chaotic, disorganized twitching.

Once fibrillation begins drugs are usually of little value. While epinephrine and isoproteronol (Isuprel) are occasionally life-saving both in fibrillation and in cardiac arrest, treatment of choice in terminal arrhythmias is cardiac massage and the direct application of an electrical current to the heart by means of a "defibrillator."

Coronary Artery Diseases

In order to keep up its constant pumping action, the heart muscle requires, and usually receives, a rich supply of blood. Ordinarily, about one-fifth of the blood driven out of the left ventricle returns immediately to the myocardium by way of the coronary circulation. If, however, these vessels fail to bring enough blood back to the heart muscle to meet its oxygen demands (hypoxia), the heart cannot function properly, and severe poststernal pain results.

The sharp, sudden pain of angina pectoris, for example, is believed to be due to failure of the coronary vessels to dilate enough to meet the needs of the heart for the extra nourishment it requires during exertion or emotional stress. Such pain may best be halted by the action of drugs that dilate the coronary arterioles and relieve the cardiac hypoxia.

Among the most rapidly effective coronary vasodilators are nitroglycerine and amyl nitrite. Carried swiftly to the coronary vessels —by inhalation, in the case of amyl nitrite, and by absorption from a sublingual site, in the case of nitroglycerine—these drugs act directly on the muscular walls to relax them. As a result, the arterial channels are widened, the blood supply to the heart is increased, and pain is promptly relieved.

Less rapid, but more prolonged in their action, are various organic nitrates, including pentaerythritol tetranitrate (Peritrate). Compounds of this kind are used mainly for long-range prevention of anginal attacks rather than for quick relief in emergencies. Aminophylline, papaverine, and their derivatives also have the ability to relax smooth muscle spasm. However, their effectiveness in increasing the flow of blood to the heart is somewhat controversial.

Some doctors not only use these drugs in angina pectoris but even after coronary occlusion to bring about an increased collateral circulation and thus reduce the extent of damage to the myocardium. Other physicians feel that these vasodilators may do more harm than good by making the heart work harder than it should after a coronary attack.

Differences of opinion also exist as to the value of anticoagulant

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"Specialling" Heart Surgery Patients

FOREWORD: *This article, prepared specially for our symposium by a private duty nurse, is based on the author's experience in providing total care for 187 patients who have undergone cardiac surgery. Most of these patients, we are told, have subsequently returned to full activity.*

NOWHERE, perhaps, is private duty nursing more essential than it is in the first forty-eight to seventy-two hours following cardiac surgery. Here, where the basic principles of good nursing are of vital importance, and where specialized knowledge is an added requirement, the nurse must also be able to impart confidence to her patient at every step.

This means, of course, a sound psychological approach from the outset. Ideally, though this isn't always possible, the nurse visits the patient a day or so before operation, mainly to review the preoperative teaching already begun by the general duty nurses, but also to establish rapport. In this initial meeting, her own confidence in the outcome of the operation should be manifest, as well as an ability to speak reassuringly to the patient.

If conditions permit, she may arrange a visit from one of the ambulatory patients who is recovering from heart surgery. (It is most encouraging to see a convalescent cardiac patient walking on his third or fourth postoperative day.) The patient about to be operated upon can be greatly encouraged by the recovering patient's own story contrasting his limited activities before the operation with the many added activities he has been able to engage in postoperatively.

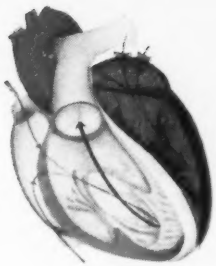
During the week prior to surgery, x-rays and EKG's are supplemented by the following laboratory tests and observations:

1. Reaction to drugs used during and after surgery.

2. Serial vital capacity tests—to determine the relative amount of fluid in the lungs. These tests, together with the patient's weight as recorded every other day, indicate the degree of heart failure.

3. The eosinophile depression test—to determine the adrenal cortical activity. (Unless the cortices

by Marion Whiting, R.N.



have a normal response to the stress of surgery, corticoids must be administered to remedy the deficiency.)

4. Determination of venous pressure—to indicate the degree of right-sided heart failure.

5. Timing of the blood flow from arm to lung and from arm to tongue. Variations in these circulatory rates are significant diagnostically.

Although the preoperative teaching is largely carried out by staff nurses, it's important that the private duty nurse knows what it encompasses:

▶ The patient is taught to cough voluntarily, and is told that he will be asked to do so as soon as he awakens from the anesthesia.

▶ A small tube, inserted in his chest during surgery, will enable secretions to flow from his chest to a drainage bottle under his bed. The bottle will contain a saline solution (1,000 cc.), and even a small quantity of blood draining into it will discolor it. (This fact is also explained to the family, lest they think that the bottle's entire contents are blood.)

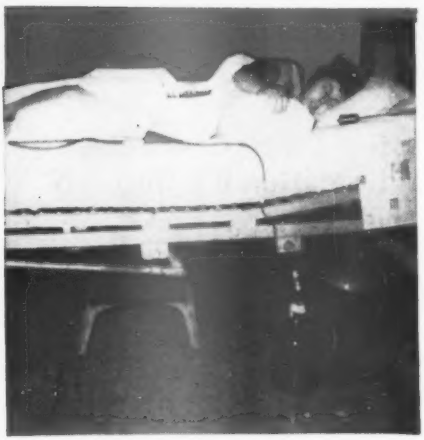
▶ The patient is told that he will be turned every hour to prevent congestion in the lungs. In explaining this, the lungs are likened to moist sponges, thus: if you hold such a sponge in a given position and don't move it, its fluid contents will gravitate to the bottom and stay there till the sponge is turned.

▶ The turning sequence may also be explained: from left side to back, from back to right side, from right side to back—and so on.

▶ All equipment to be used postoperatively is described—with emphasis on such items as the nasal catheter (to be used, if need be, for the administration of oxygen) and the blood-transfusion bottle which will hang from a stand at the foot of the bed. The patient is told that this blood will flow into a vein in his ankle, and that he must expect to receive a second bottle later.

▶ Concerning food and drink, he is told that water will be given as soon as possible; that his fluids will be limited for the first forty-eight hours; that he may have food as soon as he wishes; and that he will be urged to eat a small amount of soft food the morning following surgery. [*Turn the page*]

Room ready for postoperative care, with pillows for positioning patient, box of drugs, drainage bottle and tubing, hemostat taped to bedpost, oxygen tanks, etc. Note heeled shoes for early ambulation.



One hour after surgery: Patient on operative side to promote drainage; pillows support back, knees, arm; tubing pinned to sheet to prevent looping; lamp under bed facilitates close watch of drainage.

During the preoperative testing period, the patient has, of course, become accustomed to having his blood pressure, pulse, and respirations taken frequently. Hence, he is well prepared for these routines when they are repeated just prior to surgery and afterward.

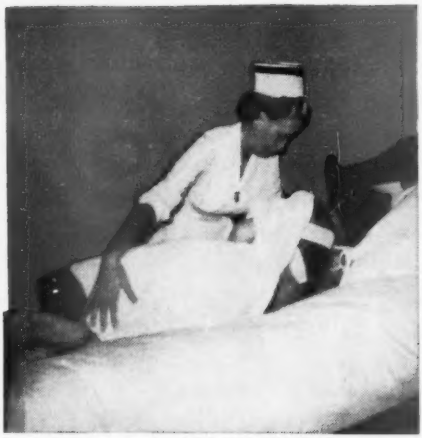
From his surgeons he learns that he will be put to sleep in his room, and that he will be aware only of the insertion of a needle in his arm. Most patients, having faced the thought of surgery for some time, are grateful for this information. Similarly, a patient is relieved to hear that the nurse will keep his relatives posted on the progress of the operation, and will permit them to visit him as soon as he awakens.

Preoperative orders instruct the general duty nurse not to awaken the patient on the morning of the operation until his special nurse arrives. Whether he is sleeping or awake, she enters quietly (without turning on the overhead light), identifies herself, and unhurriedly begins the routine preparation. A mild sedative is given, temperature taken, and the patient bathed. He then demonstrates his ability to cough, and repeats the exercises he has been taught: the left-arm movement (which encourages normal postoperative range of motion) and the foot exercises (which aid the flow of venous blood in the legs and maintain muscle tone).

As nurses, we must realize that patients facing heart surgery react

48 hours postoperative: Patient in chair after walk around room.→

Coughing and deep-breathing routines are started as soon as patient regains consciousness. Here nurse helps patient to cough by supporting left side of chest, front and back, to "splint" the incision.



Preface to ambulation: Patient, brought to edge of bed, is turned on right side; nurse, with left arm lifting patient's right shoulder, uses right hand as shown to draw patient's legs over side of bed.

in varied ways. Some are depressed; but the more common attitude reflects a feeling of relief and an eagerness to have the operation performed. Often, however, a cheerful manner may conceal fear; hence, a patient must not be given any less psychological support merely because the nurses' daily notes indicate that he is gay and apparently not concerned about his pending surgery. Obviously, we must guard against maudlin sympathy in our remarks; they should be sprinkled with such casual phraseology as, "When you're up and walking" or, "When you start stair exercise . . ."

After the sedation has taken effect and just before the patient becomes drowsy, we ask him—largely as a psychological maneuver—if he has shoes with heels to wear when he gets up. True, heeled shoes are desirable in early ambulation—to prevent strain or injury in those who have, or may develop, short heel cords—but the real value of the question lies in its effect on the

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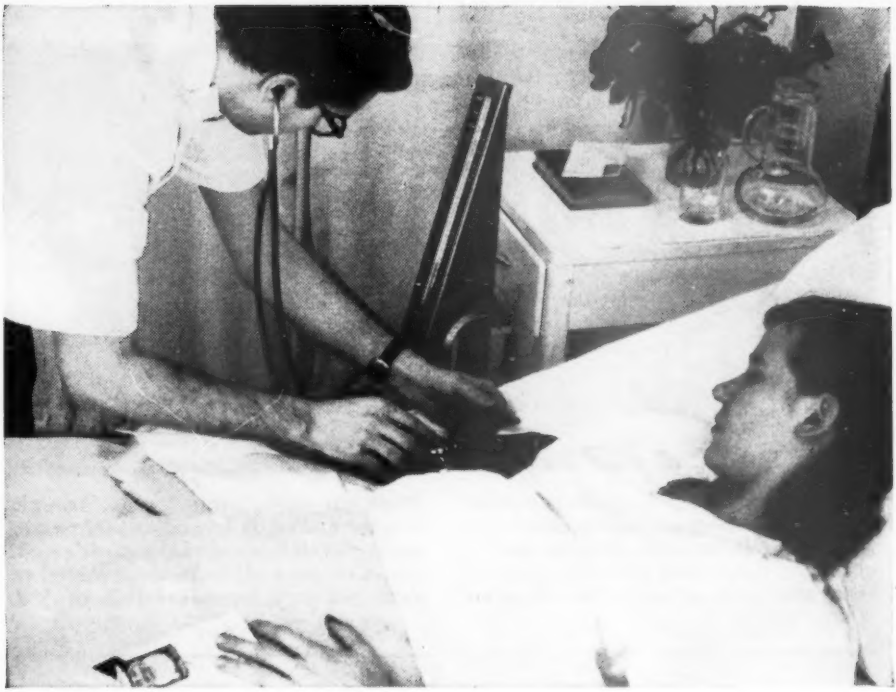

Strict and consistent accuracy in the measurement of bloodpressure is difficult to achieve at best. If just one possibility for compounding error can be eliminated, why not?

The mercury displacement principle in sphygmomanometry excludes the possibility of functional error in the instrument itself. It does not depend on the elasticity of metal, which varies, or on moving parts, which wear. Its action is governed solely by gravity—the most constant and unequivocal force known. As such, it provides the standard against which other types of manometers must be calibrated and checked when their accuracy is in doubt.

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NURSE'S CONTRIBUTION

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they are more likely to relax and thus automatically help in keeping the pressure down to the basal level—usually the doctor's objective.

Again, in the administration of drugs, the nurse can do much to minimize anxiety by teaching the patient about his therapeutic regime. He should know the desirable and undesirable effects of his particular drugs. For example, he should be cautioned about sitting or standing suddenly if he is receiving ganglionic blocking medication; he should be warned that these sudden postural changes may result in dizziness and faintness (orthostatic hypotension). He should be encouraged to talk about his personal experimentation that he more than likely carries on in private. He wants to be sure that the information about this drug was correct and applied in his case.

In administering the new antihypertensive drugs, consultation with the doctor may be necessary on certain points. When, for example, a drug is ordered "t.i.d.," the nurse should find out whether it is to be given before meals, after meals, or at equally spaced intervals. Some physicians prefer to have the last daily dose of a rauwolfia derivative given at 4 P.M. to minimize side effects at night.

It has already been noted that those receiving ganglionic blocking agents should have their blood pressure readings taken beforehand—either in standing and sitting positions, or standing and lying. If the reading differs markedly from the one obtained previously, the drug should be withheld until the doctor is consulted. This is substantially the same procedure that is followed in administering digitalis to cardiac patients.

Orthostatic hypotension may occur in hypertensive patients recovering from a sympathectomy—an operation in which sympathetic nerves in the spinal region of the thorax or abdomen are severed surgically. Such surgery—an alternate to the use of drugs for blocking the nerves chemically—is generally done in two stages; *i.e.*, on one side of the body at a time. Postoperatively, the patient has considerable pain. Liberal morphine dosage may be indicated to relieve discomfort and to make it easier to cough and breathe deeply.

To sum up, these seem to be the essential points for the nurse in caring for the hypertensive patient:

▶ Help him to learn how to handle his anxiety.

▶ Give him a chance to communicate his feelings.

▶ Prepare him for any change in routine.

▶ Teach him something about his medication and what to observe.

▶ If the doctor agrees, teach him to take his own blood pressure so that he can check it at home.

▶ Help him to live within the restrictions of his disease. «»

PROLOGUE

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physically and emotionally comfortable — the group members showed that they, too, were unable to understand what the patients were trying to convey or conceal about their mental state. When we finally became aware of our own emotional and psychological blocks, we gained new insight into the patients' problems. To cite an example: In various case discussions it was said that the patient either talked too much or not enough about his condition; he either demanded too much of the nurse's time or the nurse couldn't get him to talk at all. Where previously we would have identified with the casebook nurse, we now recognized our own professional shortcomings.

It has been said that "the cardiac patient has a well-earned reputation for taxing the nurse's knowledge, skill, understanding, discretion, experience, sympathy, and physical endurance to the utmost." What does the cardiac patient expect of the nurse? Are his demands really any greater than those of other acutely ill patients? There is no doubt that cardiac nursing calls for the best in any nurse. In fact, if ever an examination were devised to separate the truly qualified nurse from her counterfeit, the testing ground might well be at the bedside of a cardiac patient.

We borrow words from the psychologists and the social scientists, enabling us to express new nursing concepts in more meaningful terminology; but what about the *understanding* of these concepts? No recording device could pick up the sound of the shattering illusions as some in the group moved toward the realization that, although we all share a vocabulary with which to express our professional ideas, actual understanding varies with the professional education and experience of each individual.

Total patient care is a term known to every practicing nurse—at least theoretically. But when the term is actually put to the acid test, the low comprehension score can be appalling. Some members of the

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group, as dedicated to nursing as any of us could wish, but brought up professionally in a nurse shortage era, revealed that they actually had guilt feelings when taking time *to talk* with patients; they believed their co-workers would accuse them of "goofing-off." How could total patient care mean anything but physical care to such nurses?

Repeatedly, as specific cases were discussed, group members suggested that a psychiatrist should have been brought in. The patients in these cases, incidentally, had invariably expressed a fear of death in the indirect language of the sick. Obviously, some group members either felt too insecure to reassure these patients or didn't understand that psychological support was a part of the nursing role. In one case, the patient—a psychologist—was completely negating his bedrest by emotional overactivity and vocal efforts to ventilate his anxieties. Members of the group asked: What could nurses do for him that he, himself, couldn't do better with his psychological background? Physician, heal thyself!

It is the hope of our editors that this cardiac symposium will not only add to the sum total of your technical knowledge but will also give you a new insight into that highly significant factor, psychological care—a factor indelibly impressed upon those who attended the Colorado cardiac institute.

—ALICE R. CLARKE, EDITOR

RHEUMATIC FEVER

continued from page 65

Other laboratory tests, including the electrocardiogram, are used. None of them is faultless.

During the convalescent period, a cooperative team of doctors, nurses, medical social workers, teachers, and rehabilitation personnel plays an important part in the patient's adjustment to the demands of daily living.

▶ Physicians help to prevent a dread recurrence of the rheumatic process by prescribing daily drug prophylaxis. Streptococcal infections are treated promptly with penicillin. Sometimes a false diagnosis of heart damage is avoided by referring patients to special diagnostic centers.

▶ The entire team helps the child or adult find a vocation that will not only enable him to work within his limits of endurance but also will offer him an opportunity to earn an adequate income.

▶ Nurses, more than other members of the team, can teach the patient and his family much about overcoming the daily problems of individuals with rheumatic heart disease. Perhaps the most important message is the fact that strep infections, which trigger rheumatic recurrences, must be avoided at all costs. This is far more important than the old dictatorial statements about bedrest or great reduction of physical activity. «»

"SPECIALLING"

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patient's morale: he is comforted to know that the nurse is confident that he will soon be up and walking. Such maneuvers not only inspire confidence but also keep the patient's heart rate from increasing and give the sedative time to reach its maximum effectiveness. By the same token, the door should be kept closed to minimize disturbing noises and to keep those who aren't needed from entering the room.

When the anesthesiologist arrives, he administers sodium pentothal, and the patient is gently lifted to the O.R. cart. The room is then prepared for postoperative care. Equipment and supplies, comparable to those of the recovery room, include extra linen which will enable the nurse to function without leaving the patient. Among these items is a cardiac surgery box, containing both routine and emergency medications; this box is kept in the room for forty-eight hours.

It has been my privilege to observe the actual surgery on each of my cardiac patients. This has been of inestimable value, both in carrying out postoperative procedures and in furnishing comprehensive reports to other nurses.

When the patient is brought back from the O.R., he is approaching consciousness; the anesthesia given has been light, and has been supplemented by muscle relaxants. Hence, the coughing and deep-

breathing routines can be started almost at once. The nurse places her hands in front and in back of the left side of the chest to "splint" the incision as the patient coughs. If the patient is able to sit up, coughing is much more effective.

Blood pressure, pulse, and respirations are taken and graphed every twenty minutes—the graph revealing at a glance the gradual stabilization of the blood pressure and the amount of pulse deficit, if any. Both the apical and radial pulse rates are recorded, with the radial charted as a solid line and the apical as a dotted one; once the two rates become equalized, only the radial pulse is taken.

Use of the graph enables the nurse to note changes resulting from turning the patient and from the administration of various drugs. It also enables her to realize that temporary hypotension may be of little consequence in the absence of other signs—such as a rapid thready pulse, cold damp extremities, and pallor.

When checking blood pressure, the nurse should be sure that her expression is noncommittal. Here, an encouraging word is indicated; and she should particularly guard against a hurried exit—for the patient is almost sure to interpret her haste as a rush to call the doctor.

The tubing of the closed thoracic drainage bottle is fastened to the bed with safety pins and rubber bands, so that it will remain slanted downward and not become looped. The tubing is kept open by firmly com-

pressing its entire length with the fingers and/or by sucking on a second tube provided for this purpose. A hemostat is taped to the bed, so that the drainage tube can quickly be clamped off in case the bottle is accidentally broken or in case it becomes necessary to clear the tubing of clots.

Improved circulation following heart surgery often makes the patient suddenly conscious of bodily warmth—and especially of heavy bedding. Usually a sheet or cotton blanket is sufficient covering.

The bladder should be checked for distention, inasmuch as the improvement in the blood supply to the kidneys may result in distention while the patient is under sedation.

The dosage of medication for pain is carefully regulated; thus, the patient is not only enabled to rest well but also to cooperate in the coughing and exercising procedures. The dosage naturally varies with each individual; and the nurse's observations are important in determining the quantity and the proper interval.

In turning, the patient should be told that the pain thus caused will subside and that it doesn't indicate that anything has suddenly gone wrong. Most patients can tolerate pain if they're sure that being moved doesn't harm their incisions.

If the chest is clear on the second postoperative day, the drainage tube is removed and the patient is allowed out of bed. He is cautioned, however, not to sit in a chair for more than five or ten minutes at a time; moving about is necessary to keep the venous circulation functioning properly.

Once ambulation is begun, progress is usually rapid. On the sixth or seventh postoperative day, the patient should be ready to start his stair exercises; he begins these by climbing four steps t.i.d., adding two steps a day until he can handle a normal flight of stairs.

Some patients suffer a temporary depression about the fourth postoperative day. In such circumstances, both the patient and his family are informed that this is a natural "let-down" after the strain of facing heart surgery, and that it generally doesn't last more than twenty-four to forty-eight hours. If the depression is severe, the doctor may prescribe Dexedrine or some similar drug.

A word here about visitors: The patient readily accepts the fact that his relatives will be allowed to see him for only a few minutes during the early postoperative period. When members of the family appear, the nurse should see them before they enter the patient's room and remind them that they can help immeasurably by smiling and concealing their apprehension. Anyone too emotionally upset should not be allowed to see the patient at this time.

As I see it, heart surgery offers an outstanding example of the teamwork principle: Here, surgeons and nurses, working together, are helping to rehabilitate an ever-increasing number of cardiac sufferers. «»

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ter and helps open up the tube. To clear tubes, clamp with Kelly and clean with alcohol. Then insert a No. 22 needle below the Kelly clamp. Milk tubing with fingers to dislodge clots.

Certain precautions are necessary in handling chest tube hookups. Everyone on the unit should be warned that only doctors and nurses familiar with such equipment should handle it. The glass drainage tubes must always be below the fluid level in the bottle. If a leak appears, the tube should be clamped off above the leaking point, and someone in authority notified immediately. Drainage bottles must never be removed from the bedside while in use; in some hospitals, they are taped down to prevent removal. So, too, is the Gomco switch —lest it be turned off accidentally.

Administration of antibiotics is routine in cardiac surgery. Penicillin and streptomycin may be given during the first postoperative week, with Achromycin serving as a penicillin substitute in case of allergy. Narcotics are given for pain and discomfort, but in a dosage that won't depress respirations or make the patient so lethargic that he can't cooperate in coughing.

Fluid intake and output must be accurately recorded. Everything is measured: vomitus, urine, chest drainage, blood, I. V. fluids, and oral fluids. In checking the character of drainage from the chest, it's important to note how long it remains bright red. The prolonged presence of bright red blood may indicate continuous fresh bleeding. On the other hand, serous fluid may reveal infection.

Sometimes the patient is troubled by continuous vomiting that he can't control. This is attributed to surgical disturbance of the vagus nerve. Thorazine and Marezine may relieve this vomiting, but it may also be necessary to use the Levine tube and Wangensteen suction.

From the outset, the patient is encouraged to exercise, assisted by the physiotherapist. The first day, he brings his arms back and forth

three or four times, and takes deep breaths. These exercises, and more strenuous ones later on, gradually accustom him to normal activity.

This program, however, is not recommended for coarctation patients whose tissues in the operative area are more likely to break down. Such patients may be kept sedated, and are not required to cough or turn for as long as four days. In some cases, they may not do anything for themselves during this period. After the fourth day, they may be moved from side to side; about two days later, they are placed in modified Fowler's position.

Usually, patients may be allowed out of bed about the third postoperative day, even though their chest tubes haven't yet been removed. By this time, they can generally use a chair or walk as far as the door.

On the basis of x-rays taken daily at the bedside, the chest tubes may be removed on the third or fourth day. While the patient lies on his right side, the doctor stands behind him and instructs him to take a deep breath, exhale, grunt, and then refrain from breathing. As he holds his breath, the doctor quickly takes out one tube and pulls up a purse-string suture to cover the hole. After the second tube is similarly removed and the sutures are tied off, Vaseline gauze is laid over each hole and secured firmly with wide strips of adhesive so that there is no danger of air entering. About an hour after the tubes are out, the patient's improved attitude clearly shows that he's free of a great deal of painful agitation in the chest.

The diet of cardiac patients is an individual matter. Fluids are given at first, followed by a soft diet, then a regular diet as more interest is shown in food. As convalescence progresses, the patient shouldn't be treated as an invalid. His family should understand that anyone who has had cardiac surgery tends to keep within the limits of fatigue in the matter of activity. To advise such a patient not to move around or do anything for himself is definitely wrong. In fact, such advice could very well negate the extraordinary benefits gained through cardiac surgery. «»

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agents for preventing further attacks after a myocardial infarction. Some authorities doubt that these drugs really increase long-range life expectancy, but nobody questions their ability to interfere with normal blood clotting.

Certain anticoagulant drugs create an artificial shortage of one or more of the essential clotting elements, thus interfering with the normal clotting process. Those of the coumarin (Dicumarol) and indandione (Dipaxin) types, for example, appear to interfere with liver synthesis of the clotting factor prothrombin and closely related elements. Heparin, on the other hand, does not prevent prothrombin formation; instead it interferes with the conversion of prothrombin to thrombin, and with the reaction of thrombin with fibrinogen to form fibrin. In either case, clotting within blood vessels is retarded, and the danger of further formation of thrombi and emboli is reduced.

Administration of anticoagulants must be carefully controlled by frequent laboratory tests to reduce the risk of hemorrhage. However, effective antidotes are available to overcome this complication. Intravenous administration of vitamin K_1 overcomes a deficiency of prothrombin. Hemorrhage due to an excess of heparin may be counteracted by giving a dye, toluidine blue, or a protein from fish eggs, protamine sulfate. Blood transfusions may also be necessary.

Hypertension

Abnormal elevation of blood pressure may result from a number of different causes, but most of the measures employed in the management of hypertension have as their objective the relaxation of vascular constriction.

While many drugs can dilate the blood vessels and bring about a lowering of blood pressure, few are of practical value—mainly on account of the severity of their side effects. However, several different types of drugs developed recently are capable of lowering blood pressure with comparative safety. Their judicious use can prevent the more annoying symptoms of hypertension and reduce the incidence of serious complications.

The less severe grades of hypertension are treated with sedatives which reduce emotional tension. Reserpine and other rauwolfia derivatives, in addition to their tranquilizing action, appear to reduce vasoconstrictor impulses by inhibiting the hypothalamic centers in the brain that regulate blood pressure Hydralazine (Apresoline) is a drug thought to act similarly.

Recently, a new class of compounds, the ganglionic blocking agents, has been widely used in the treatment of severe hypertension. These drugs block excessive sympathetic vasoconstrictor impulses at

the ganglia, groups of nerve cells that serve as relay stations in the transmission of such impulses between the central nervous system and the muscular walls of the arterioles. However, the more effective these drugs are, the greater appears to be their danger; for, by cutting off the normal flow of nerve impulses over both the sympathetic and parasympathetic systems, such drugs as hexamethonium, pentapyrrolodinium (Ansolysen), and other ganglionic blockers also throw many normal physiological functions out of kilter.

Despite the occurrence at times of severe side effects, and despite the fact that none of these drugs can cure the underlying condition, these antihypertensive agents are prolonging the lives of people who would otherwise have died of the devastating effects of progressive hypertension on the heart, brain, and kidneys.

Perhaps the intensive research now being carried on concerning the causes of atherosclerosis will culminate in the discovery of an entirely new class of safe drugs, effective not only against hypertension, but also against coronary disease and heart failure. For present evidence indicates that the deposition of lipids within the walls of blood vessels is the dominant cause of atherosclerosis and other cardiovascular diseases. «»

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profession into three camps: those who use it every time, those who use it in severe cases but not in mild ones, and those who don't use it at all. Generally speaking, though, studies have revealed the value of such therapy. One contraindication to its use, however, is the lack of laboratory facilities for determining the level of anticoagulant activity; uncontrolled administration of anticoagulants is dangerous. Another is the presence of a bleeding type of disease such as peptic ulcers. If anticoagulants are to be used, they should be started early to prevent clot formations. Usually, they are discontinued when the patient becomes ambulatory.

For several years, the leading anticoagulant has been Dicumarol, a drug that reduces the blood level of the clotting factor, prothrombin. Dicumarol takes effect in forty-eight to seventy-two hours and acts over a period of several days. Dosage is determined daily by laboratory tests which measure the prothrombin activity of the blood.

The anticoagulant Tromexan has also been used successfully as have Warfarin and Phenindione which work somewhat faster than Dicumarol. Warfarin, given orally or intravenously, produces a therapeutic level in about twenty-four hours. Like Dicumarol and several other anticoagulants, its effects are rather quickly overcome by the ad-

ministration of a small quantity of vitamin K_1.

Another intravenous anticoagulant, heparin, acts immediately, but since its effects wear off rather quickly, dosage has to be repeated at four- to six-hour intervals. This drug's activity is measured by clotting time tests rather than by prothrombin determinations. The patient can be given prompt anticoagulant therapy with heparin; immediate dosage with Warfarin produces effect in twenty-four hours and heparin can then be stopped. In some instances, when delivery or surgery is anticipated, it is desirable to continue the use of heparin alone.

Treatment aimed at improving coronary circulation now features several drugs. Although it's hard to prove the vasodilating effect of papaverine in man, this drug has been used for many years because of its mild sedative action and its freedom from complications and habituation. Sometimes it will relieve pain that is not relieved by morphine.

Although the value of aminophylline as a coronary vasodilator is questionable, too, this cardiac standby is sometimes used also. Occasionally, atropine, which is believed by some to act as a mild vasodilator and to neutralize some of the central effects of morphine, seems to exert a beneficial action.

Rest and sleep are helped by mild sedatives such as phenobarbital and Seconal. Penicillin and other anti-

biotics, it should be noted, serve no useful purpose unless infection is associated with the infarction. The use of cortisone is frowned upon for this drug probably delays the removal of necrotic cells.

Researchers are still tackling the problem of getting a better blood supply to the coronary arteries. Attempts have been made to produce a pericardial inflammation which will make the pericardium stick to the heart. It is hoped that blood vessels from the resulting adhesions will grow into the heart and act as substitutes for the damaged ones. A new surgical procedure, whose worth has not yet been fully evaluated, aims to accomplish the same result.

A few years ago there was no effective treatment for shock, the earliest and most serious of the complications of myocardial infarction. Blood transfusions gave dramatic results in a few cases but, on the whole, were disappointing, and excessive infusions led to pulmonary edema or congestive failure. Recent drug developments [Mephenteramine and Levophed] improved the outlook of shock victims.

An early and severe complication of myocardial infarction is pulmonary edema evidenced by shortness of breath, lung rales, and bloody frothing at the mouth. The patient is placed in a sitting position and given morphine often. Sometimes a special machine, which ensures positive oxygen in the lungs, is used. A mixture of alcohol and wa-

ter in the humidifier of the oxygen tent helps to break up the foamy froth and thus open the air passages.

Elevation of venous pressure in pulmonary edema may be relieved by a "bloodless" or "dry" phlebotomy which reduces the amount of circulating blood. Blood prescure cuffs serving as tourniquets are placed on each arm and each leg. On three of the cuffs, the pressure is raised to the level of diastolic blood pressure; the fourth one is uninflated. Every fifteen minutes the uninflated cuff is inflated to the diastolic blood pressure level and the next cuff is deflated. This means that the cuff on any one extremity is inflated forty-five minutes out of each hour, with the result that blood is trapped in the lower and upper extremities. Since pulmonary edema may recur when the procedure is discontinued abruptly, a cuff is taken off each fifteen minutes until all are removed.

The use of drugs in pulmonary edema is open to question. Many physicians, however, find that digitalis and aminophylline are beneficial. Diuretics are also used to remove excessive fluid.

In the arrythmias associated with myocardial infarction, digitalis is used to slow the rate of auricular fibrillation. Quinidine is also given to reduce the number of premature beats. Procaine amide (Pronestyl) —a reasonably safe drug—helps to curb ventricular paroxysmal tachycardia. In cases of serious infarction with this latter arrythmia, this

drug is given quite slowly—not over 100 mg. a minute—by the I.V. route. Electrocardiograms are taken to check the patient's reaction. The drug is given until one gram has been absorbed, or until the rhythm has been converted, or until side effects appear.

If the tachycardia does not respond to procaine amide, quinidine may be tried with an EKG control and a physician in attendance. The administration of quinidine requires a great deal of knowledge and care, not only because of its toxic properties, but because of the inherent dangers of such a condition. It has been said that ventricular tachycardia "is a rhythm so fraught with danger that any procedure, as well as the failure to act, may end in disaster."

One of the ever-present dangers in myocardial infarction, now being dissipated to a large degree by anticoagulant therapy, is clot formation. Formation of clots in the veins of the legs is not uncommon. Frequently when the infarct on the left side of the heart goes all the way through the heart, a clot may form on the inside of the heart. This may break off and go out the aorta to the brain, the legs, and other areas, with fatal results. The congestive failure on the right side of the heart contributes to the formation of thrombi and emboli. The extremities of patients should be carefully watched for thrombophlebitis. Often an elastic bandage, and bed boards to relieve the pressure of bedclothes, help this condition. «»

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waves. These new contractions may be considerably irregular but they frequently sustain someone in circulatory failure until suitable therapy can be started. This phenomenon of differing atrial and ventricular rates is often seen in various kinds of fibrillation where the ventricles respond to a more powerful stimulus, transmitted through the bundle of His and the Purkinje fibers.

From a physiological point of view, one of the most important characteristics of the heart is the coordinate action of its right and left pumps. There is bound to be trouble when something interferes with any aspect of this coordinate action. For example, a deficient aortic valve could hinder the emptying of the left ventricle, as well as the emptying of the right side of the heart. Moreover, any interference with the emptying of the atria, because of tricuspid or mitral valve disease, will almost always be followed by faulty emptying of the ventricles and all kinds of circulatory disturbances.

Another important physiological aspect of the heart is the fact that it operates in response to the demands of the body for blood. When an organ requires more blood, the heart contracts faster and more powerfully to supply the blood called for. The heart probably meets the demands put upon it in

two ways: (1) by increasing its rate, or (2) by increasing its stroke volume. The normal heart rate may cover a wide range, but it is traditionally estimated as 70. The stroke volume is the amount of blood pumped out of each ventricle at each beat. The normal adult heart beating 70 times a minute puts out about four quarts of blood in a minute (per minute volume or output); that is, with every beat, one-seventieth of 4,000 cc. (stroke volume) is squeezed out through the aorta and made available for the circulation.

How can the rate of the heart be altered or improved to meet the body's demands for blood?

We have already seen that the heart is inherently capable of setting up its own relatively sensible rate. But we also know that there are wide variations in our heart rate. We have a slow beat while resting and a fast one when we jump up and down or run up a flight of stairs. Such variations in rate are due to certain influences that cause the heart to beat faster or slower. In other words, the heart has a gas pedal or accelerator as well as a brake or depressor.

The nerves that supply the heart help adjust the rate to meet the needs of the body. From the autonomic division of the nervous system come two nerve supplies that have opposing effects on the heart rate. One, derived from the parasympathetic division by way of the vagus nerves, affects the sinu-atrial, AV nodes, and atrial muscle. Stim-

ulation of these vagus nerves slows the heart; cutting them allows the heart to beat much faster. The second nerve supply comes from the sympathetic division and affects all parts of the heart—nodes, bundle of His, muscle of atria and ventricles. Stimulation of these fibers by adrenalin, released during excitement, and by administration of certain drugs makes the heart beat faster and stronger.

The more important phase of heart control is the parasympathetic system involving the vagus nerve. Physiologists commonly refer to this type of control as vagal tone, for the vagus is always in a state of tonus, controlling and regulating the heart. Anything that will stimulate the vagus will slow down the heart, and anything that will depress the vagus will speed up the heart.

The stimulus for making the vagus swing into action comes from at least two—possibly three—inbuilt places. Of these, the carotid body (or carotid sinus) and the aortic arch are the most significant. The first area of stimulus in the carotid body is located about halfway up the neck where the carotid artery, carrying blood from the left ventricle via the aorta, branches into the internal and external carotid arteries. Here there are pressoreceptors—essentially the same kind of receptors found in the skin—that are sensitive to any increase in pressure of the blood flowing constantly over them.

Should blood suddenly be fired rapidly over the carotid body, the pressoreceptors would be stimulated to send impulses to the vagus center in the medulla of the brain. Responding to the impulses, the brain would stimulate the vagus which slows down the sinu-atrial node. This automatic mechanism permits our heart rate to return to normal after a period of exercise. Without such control, the heart would probably beat irregularly and wildly, or recklessly. Such wild beating is actually observed in patients with vagal paralysis where an impaired vagus can't decelerate or brake the heart rate.

This mechanism also works in reverse. If pressure decreases in

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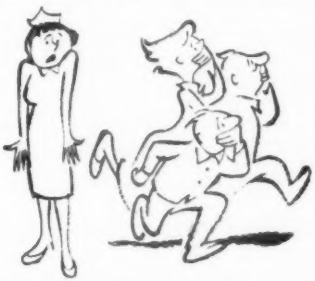
a special page for nurses
from Eaton Laboratories'
Medical Director
Paul F. MacLeod, M.D.

Prescription for emesis

The attitude of the person dispensing a drug can often have a profound psychological effect. As an example of what I mean, a letter in the J.A.M.A. (160:800, 1956), describes a group of patients who invariably had nausea and vomiting with a certain new drug. Investigation revealed that the person dispensing this drug had told each patient the study was designed to see if the drug would induce vomiting!



A few weeks later, the same drug in the same ward—but with no mention of nausea or vomiting—produced not one instance of this effect.

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Incidentally, a brownish discoloration of urine during therapy is normal. If you would like additional information about FURADANTIN, I shall be glad to send it to you on request.

EATON LABORATORIES NORWICH, NEW YORK

the carotid body, a message is fired to the vagus, depressing it and speeding up the heart. Often cardiologists test carotid reflexes by external pressure and look for pulse changes. Pressure on the carotid can frequently result in deceleration of heart action.

The second important regulating mechanism, which operates similar to the carotid sinus, is located in the arch of the aorta. As blood pounds rapidly under pressure against the pressoreceptors in this arch, an impulse is fired to the vagus center in the brain which, in turn, fires a slow-down signal to the sinu-atrial node. On the other hand, a decline of pressure in the aorta accelerates the heart rate.

This last point is significant. It means that if the ventricle fails to empty itself as completely as it should, the reduced blood volume flowing over the receptors in the aortic arch will require the ventricle to work harder. If the ventricle can't correct the discrepancy in one beat, it will try to do it in two or three beats. This is probably what happens in the tachycardia associated with shock. The ventricle is trying to compensate for its inability to maintain its proper stroke volume.

The third mechanism, the Bainbridge reflex, operates very much like the carotid body and aortic arch reflex. Pressoreceptors in the atria are stimulated when pressure increases in these chambers. For example, if blood pours rapidly into the atria, or if blood is held

within the atria, because of a tricuspid or mitral valve flabbiness or insufficiency, there is distention of these chambers. This distention fires an impulse to the vagus center which instead of stimulating, inhibits the vagus, thus accelerating the heart.

What about the factors that influence the stroke volume of the heart? The stroke volume of the heart depends primarily upon the efficiency of the valves—the tricuspid and mitral valves, the aortic and pulmonic valves. In valvular heart disease, for instance, a flabby, insufficient mitral valve may stay open allowing blood to be squeezed back through the valve into the atrium. As a result, 20 cc. of the 30 cc. total stroke volume may be propelled out of the ventricle into the aorta. 3 cc. may stay within the ventricle, and 7 cc. may return to the atrium which is already filled to its normal capacity. The ensuing distention leads to circulatory stasis, and triggers the Bainbridge reflex which makes the heart beat faster to improve the stroke volume. Frequently, though, this effort fails because the muscle fibers of the ventricles lose their elasticity and will not contract at all. When the muscle is overstretched, patients may die of acute heart dilatation.

Another factor influencing stroke volume is circulation. If blood isn't being returned to the heart fast enough, or in sufficient quantity, the stroke volume will be impaired.

[*Turn the page*]

Stroke volume is also controlled by chemical substances which favor relaxation or stimulation of the heart. That is why the use of parenteral fluids in cardiac patients, postoperative or otherwise, is an acute problem. A certain concentration of sodium ions bathing the myocardial cells is required, but an excessive amount of sodium is likely to cause cardiac disturbances. Physiologically, potassium induces relaxation of the heart, and is often given in parenteral fluids to postoperative cardiac patients. Calcium, on the other hand, promotes contraction and is avoided postoperatively in cardiac surgery unless, of course, there is a reason for increasing the rate of contraction.

Carbon dioxide, it should be noted, has some influence upon the heart rate and subsequently upon the stroke volume. Up to a certain point, CO_2 induces relaxation but after that it causes cardiac acceleration because of its stimulation of respirations. The person who is constantly exposed to CO_2 may die from what is known as inspiratory asphyxia.

This simplified review of the anatomy and physiology of the heart cannot explore many of the scientific complexities that concern cardiac researchers. Such a presentation would take us well out of the realm of nursing. Instead, the objective of this article is to "refresh" our nursing memory so that we may give intelligent care to cardiac patients. «»

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diminish. When no clear demarcation of the muffling is heard, diastolic pressure should be recorded as questionable, that is, "150/30?".

Use of the palpatory method—which provides only a systolic reading—is limited to times when a stethoscope isn't immediately available. Here, before the reading is taken, the radial pulse is checked and recorded. Then, while the pulse is held. the manometer level is raised about 30 mm. Hg above the level at which the radial pulse can no longer be detected. The pressure is then slowly released—and the systolic pressure is recorded as the level where beats at the normal rate may again be palpated. As a rule, systolic readings obtained by the palpatory method are lower than auscultatory readings.

As in other nursing procedures, skill in using a sphygmomanometer is achieved through practice. The experienced nurse doesn't have to locate the brachial artery by palpation; she unerringly places the stethoscope directly over it. Her ears are also attuned to stethoscope sounds, and she can generally determine systolic and diastolic readings with quickness and accuracy. It is well to remember, though, that the experienced nurse may become careless with increasing adeptness. Important attributes for her to retain are the conscientiousness and carefulness of the nurse-novice. «»

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in old age. A child's blood pressure is apt to be 80, 90, or 100 systolic; while an adult's ranges from 100 to 140. Pressure falls during sleep, immediately after sleep, and temporarily upon standing.

It is difficult to define normal blood pressure, but one may say that the systolic pressure of a normal person in his thirties should not be over 150, and the diastolic should not be over 90. Of course, these figures are easily changed by acute illness or psychological conditions.

The older person shows a higher systolic reading because of hard and inelastic arteries. A blood pressure of 160 to 180 over a diastolic of 80 is not abnormal for a person of 60 to 70 years; such a reading usually indicates arteriosclerosis of the aorta. In a younger person, however, such pressures would demand investigation.

In suspected hypertensive patients, the blood pressure's ability to fall may be tested by several methods. One is to take readings frequently, day and night, to relate diurnal and nocturnal variations. A second method is the cold pressor test; here the patient lies on his back in bed for at least 20 minutes, or until the blood pressure no longer falls. Then the hand opposite that of the arm wearing the cuff is immersed in ice water for 60 seconds, and blood pressure readings are taken at 30 and 60 second intervals. A hypertensive patient will show a rise of over 30 mm. of mercury in systolic pressure or 25 mm. in diastolic pressure. After the hand is removed from the ice water, pressure is taken at two-minute intervals until it falls back to its previous basal level. (Pressure normally falls back to the basal level in two minutes.)

A third method is the sodium amytal test; here, three grains of sodium amytal are given every hour for three doses. The patient is kept as quiet as possible to avoid any unnecessary stimuli. Blood pressure is recorded at fifteen or thirty minute intervals until one hour after the last dose, and then hourly until it returns to the initial level. The pressure should approach normal sometime during the test if the patient is to gain much by treatment. A fourth method, the postural test, reveals hypertension by a 15 to 30 mm. rise in diastolic pressure upon standing.

It can readily be seen that great strides have been made in the diagnosis and treatment of essential hypertension. Probably these advances equal those made in the surgical treatment of rheumatic and congenital heart disease. When we think of what we can do now and what we could do five or ten years ago, the difference is astounding. Some even dare to hope that the next decade may bring not only a cure for hypertension but prevention as well. «»

lifesaving technique for the unborn includes high citrus intake

Abortion-prone mothers deliver live babies in nearly 9 out of 10 pregnancies

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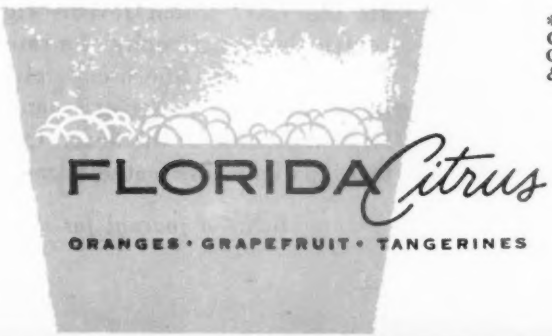
*Javert, C. T.: Obst. & Gynec. 3:420, 1954; *Cf.* Greenblatt, R. B.: Obst. & Gynec. 2:530, 1953.



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Appearance of the contrast media in the aorta in an unusually short period of time shows that it has come from the right ventricle through a defect in the ventricular wall into the aorta.

Surgery in the past has offered great benefits to patients with this anomaly and the future promises even greater benefits and in some patients possibly complete cure. Procedures such as the Blalock-Taussig or Potts operations (Fig. B) created anastomoses between the subclavian arteries or (Fig. C) the aorta and the main, left or right pulmonary arteries. These operations increased the flow of blood into the pulmonary vascular bed and thereby greatly benefited many patients but they, of course, in no way corrected the underlying basic defects within the heart. Thus, they were but palliative procedures.

Since the advent of pump oxygenators, namely, machines that assume the tasks of oxygenating and pumping the blood about the body, more definitive procedures are possible.

Now under these conditions the right side of the heart may be opened and the ventricular septal defect closed and the pulmonary obstruction may be relieved. This may be a curative procedure; however, the mortality of this procedure remains very high, namely about 35-40 per cent.

Atrial septal defect is another congenital anomaly, marked by an opening in the wall between the two upper chambers. In this condition, some of the blood returning to the left atrium from the lungs travels through the atrial opening to the right atrium instead of going to the left ventricle to be pumped out to the body. The blood which recirculates in this manner makes additional work for the right side of the heart; as a result, hearts which have to cope with such a workload may be quite large, and there may be considerable pulmonary congestion.

Many persons with this defect get along reasonably well without surgery. In fact, there are reports of women with atrial septal defects who have borne as many as six, seven, or eight children, and who lived to be sixty or seventy years of age. These patients are the exception, however, and the usual life span of patients with this defect is between thirty-five and forty years. Surgery is usually indicated for young patients, since it enables them to lead normal lives without discomfort and shortness of breath. After surgery, the vascularity of the lungs is much less and the heart decreases in size.

Two important factors in the diagnosis of an atrial septal defect are the EKG which reveals right ventricular hypertrophy of a rather selective type and fluoroscopy which shows increased vascularity and a large right side of the heart. Often these patients are catheterized in

order that the oxygen content of blood samples taken from the vena cavas entering the right atrium may be compared with that of blood taken from the right atrium. If there is an opening in the atrial wall allowing bright red, highly oxygenated blood from the left atrium to pass through and mix with the relatively unoxygenated blood, the blood sample from the right atrium will reveal a higher oxygen content.

Up until about five years ago, there was no way of closing such a defect in the wall of the atria. Now there are five different ways in which the opening can be closed. In most of these operative procedures, however, one is compelled to work blindly in a bloody area. The ultimate goal in this type of surgery is a clear, dry field so that the surgeon can see the opening and close it with deliberation.

One way of accomplishing this goal is through the use of hypothermia, a chilling procedure that lowers the body temperature as well as the oxygen needs of all tissues, including brain tissue, which is most sensitive to lack of oxygen. In repairing atrial septal defects, patients' temperatures are lowered to a range of 29.5 to 31 degrees C.* This allows surgeons to occlude all circulation in the body for a period of between six and seven minutes. Probably the simplest way of lowering the temperature is to place patients in a hammock or sling in a bathtub filled with cold water and ice.

When their temperature finally reaches 32 or 33 degrees, the preoperative patients are taken out of the tub, for after removal their temperatures may drift down as low as 29 degrees. The first step in the operative procedure is placing tapes around the vena cavas so that blood cannot enter the heart. A clamp placed across the aorta and pulmonary artery prevents air from entering the coronary circulation. Now the heart can be opened and the atrial septal defect repaired in a dry, clear field. No blood passes through the heart for a period of as long as six minutes. With this method, patients have had complete

*85.1 to 87.8 degrees F.

closures, with a low mortality."

Another method of providing a dry, unobstructed operative field is a device that allows circulating blood to bypass the heart completely. Briefly, it works like this. Catheters are placed in the two vena cavas so that blood returning from each orifice does not enter the heart. Blood then goes through a simple pump which pumps it into a large cylinder where it receives the oxygen it would normally receive in the lungs. Another attachment removes the bubbles from the blood before it goes to a second pump which propels it through a tube placed in the left subclavian artery. Thus, oxygenated blood is returned to the systemic circulation.

Ventricular Septal Defects

In contrast to hypothermia which provides an operating time of about seven minutes, the mechanical heart allows surgeons to work with the heart for periods of fifteen or twenty minutes or longer. This extension of time is particularly helpful in repairing ventricular septal defects, a procedure requiring at least twelve to fifteen minutes. The ventricular septal defect is high, well up beneath the aortic valve, and can best be corrected when the surgeon works in a bloodless operative field. Children with large defects of this type are often small and subject to upper and lower respiratory infections, otherwise the history is of little diagnostic value.

The physical examination of the patient with a ventricular septal defect reveals murmurs that are suggestive of the correct diagnosis. The EKG reveals hypertrophy of both ventricles in contrast to the EKG finding in atrial septal defects where the right ventricle only is hypertrophied; increased vascularity of the lung fields is demonstrated by fluoroscopy.

As in other cardiac surgery, surgical repair of ventricular septal defects may not be successful and may even end fatally. Patients with severe congenital anomalies can frequently withstand the trauma of the operation if their defect is corrected. But if they are not helped by the operative procedure, the

trauma involved may be more than their laboring hearts can withstand.

Pulmonary stenosis (one of the defects of the tetralogy of Fallot) involves either the cusps of the pulmonic valve or the area below the valve. Frequently patients have stenosis of this valve as the only defect within their heart. If the cusps are affected, a valvulotomy is performed, thus relieving the obstruction of the flow of blood to the lungs. Previously, a knife was passed blindly through the right ventricle to open the narrowed pulmonic valve. Now surgeons may operate with more accuracy and ease by opening the pulmonary artery and viewing the stenosed area. Hypothermia occludes the circulation and permits an unobstructed view of the operative site.

The fact that persons with pulmonary stenosis are exceptionally vigorous, acyanotic, and have a relatively normal heart size sometimes misleads physicians. Actually, this is a malignant lesion, and those who seemingly are getting along perfectly well may have a pressure of 150 to 200 mm. Hg within their right ventricle in contrast to a normal pressure of 25 to 30. That's why cardiac catheterization, which reveals this dangerous pressure, is frequently required in evaluating the severity of this defect. If the anomaly is not corrected, the heart may begin to fail and dilate rapidly. Death quickly follows.

Cardiac surgery, in general, is not followed by a painless postoperative period. Patients may have severe pain in their chest for a few days following surgery. Pain and chest soreness are easily understood when one realizes the trauma involved in cutting through the chest. Children, however, weather such surgery with their usual youthful aplomb; they are generally up and around in three or four days, with no difficulty whatsoever.

Physicians and nurses have to remember that cardiovascular surgery is at times followed by personality changes. Many patients are mentally depressed after their operation. They feel that surgery has been but a last resort and fear that they may not have been helped. Excitement and hysteria may also appear in these patients postoperatively. The postoperative attitude depends a great deal on the psychological preparation for surgery of the patient and this is the responsibility of the physician. Knowledge of the underlying defect, what symptoms to expect, and other pertinent factors are important and must be discussed with the patient and family prior to surgery.

Despite operative failures in cardiac surgery, there are many remarkable results. At the present time, 90 per cent of patients with congenital heart disease who live beyond three years of age may expect to be cured or greatly helped by surgery. This outlook was made possible by the pioneers in cardiac surgery as well as by the development of antibiotics and advances in anesthesia. «»

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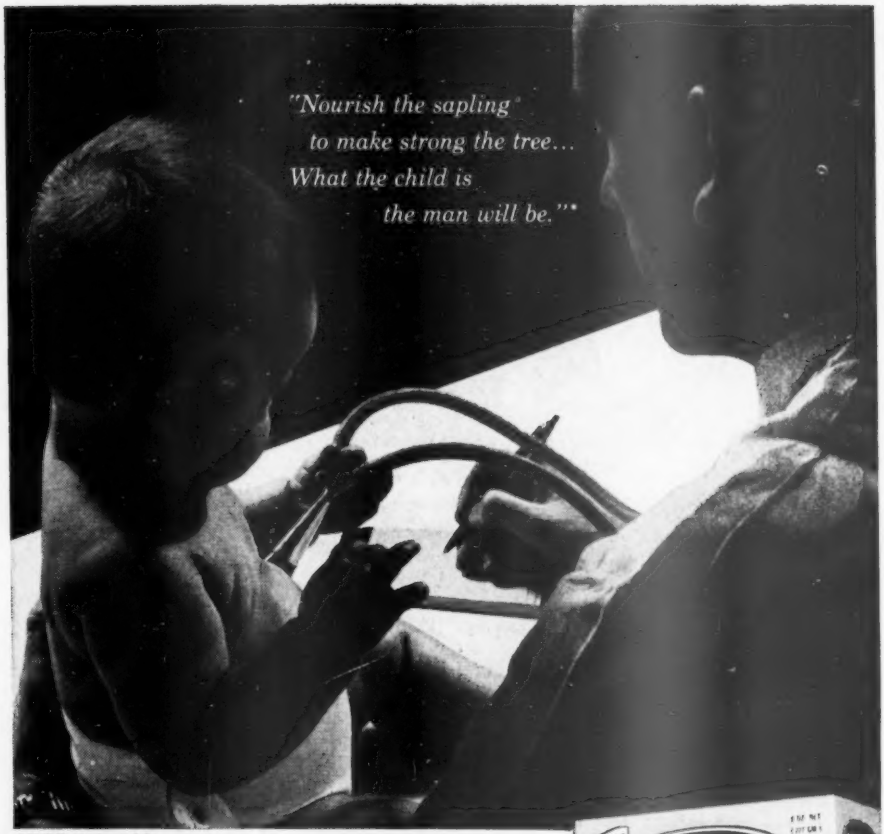

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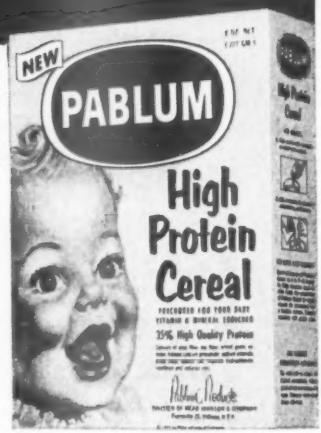

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DIRECTOR OF NURSING EDUCATION: Ambitious nurse with degree to be responsible for two-year college training program in large tuberculosis hospital. This may be the opportunity you seek and merit. Liberal holiday, vacation and illness allowances. New air-conditioned building. Salary $4500. Please send detailed resume of training and experience to Personnel Director, Board for Texas State Hospitals and Special Schools, Box S, Capitol Station, Austin, Tex.

DIRECTORS OF NURSING: (a) Leading 400 bed univ hosp, exceptional rating, exc. future opport, pd tuition to further educ, key city, E. $8000. (b) Asst. Dir, leadership, initiative important, noted progressive 400 bed hosp, English-speaking personnel, int cosmopolitan city outside U.S. $7000. (c) Consultant, investigate private nursing homes, determine eligibility for state approval. $6600, travel expenses. (d) Dir, School and Service, 300 bed genl hosp, well integrated school, univ city, Pacific NW. $7200. (e) Male Dir, Nursing Service, lge psych, inst. $7500, also Asst. $6350, vicinity Wash. D.C. RN 1-3 Burneice Larson, Medical Bureau, 900 N. Michigan Ave., Chicago, Ill.

EDUCATIONAL DIRECTOR: New school opens in September, 385 bed hospital. Excellent policies. Apply Director of Nursing, Duval Medical Center, Jacksonville, Fla.

EXPERIENCED OPERATING ROOM SUPERVISOR: R.N. Male or female. Position open. Apply Director of Nurses, Lutheran Hospital, Baltimore 16, Md.

FACULTY POSTS: (a) Dir., nationally accred. school, 180 students, modern hotel-residence facilities, cultural univ city, mild climate, top salary. (b) Fundamentals of Nursing Inst, communicable disease, 300 bed hosp, American-owned oil company, foreign operation, exc. employee facilities. $8500-$9200 tax free, mtce, pd air travel. (c) Asst. Professor —class advisor, renowned univ. med school, 130 students, ideal west coast location. $5000. (d) Psych. Inst, coordinate 2 schools, nursing with state college, academic rank, coll. personnel policies apply, ocean port, to $7200. S. RN 1-4 Burneice Larson, Medical Bureau, 900 N. Michigan Ave., Chicago, Ill.

GENERAL DUTY: 40 hr wk, 84 bed hospital, finest equipment, very liberal personnel policies and pleasant working environment. Must be willing to rotate shifts. Salary range $277 to $360 monthly. Atomic Energy Project but not Civil Service. Write Director of Nursing Service, Los Alamos Medical Center, Los Alamos, N.M.

GENERAL DUTY & OPERATING ROOM NURSES: Wanted immediately for 150 bed hosp. 40 hr wk with liberal personnel policies. Nurses Home available at reasonable rates. All-graduate nursing staff. Apply Dir. of Nurses, Morrell Memorial Hospital, Lakeland, Fla.

GENERAL DUTY NURSES: Would you like to enjoy the vacation land of America? Winter skiing, summer horseback riding, see Yellowstone National Park. Read all about this area in January 1956 issue of National Geographic. Excellent personnel policies, 5 day wk, 8 pd holidays, salary $260, differential $10 for p.m. and nights. Permanent and summer relief positions open. Please apply Superintendent of Nurses, St. John's Hospital, Jackson, Wyo.

GENERAL DUTY NURSES: For 135 bed eneral hospital. Organized medical staff, high quality services, pleasant surroundings, comfortable living conditions in nurses home, excellent personnel policies. Apply Director of Nursing, John D. Archbold Memorial Hospital, Thomasville, Ga.

GENERAL DUTY NURSES: For 76 bed general hospital in university town. Prevailing salaries paid. Full maintenance available. Redlands Community Hospital, Redlands, Calif.

GENERAL DUTY NURSES: 210 bed teaching hospital 35 mi from NY. 40 hr wk, $30 differ-

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ential for eve duty, $20 night. Regular increments, liberal sick lv, vacation, 8 holidays, Social Security, uniform laundry, living facilities provided. Director of Nurses, White Plains Hospital, White Plains, N.Y.

GENERAL DUTY NURSES: 118 bed general hospital located in a beautiful residential section along the North Shore of Chicago. Starting salary $300 a month, bonus of $30 for evenings and $20 for nights. 40 hr. wk. Modern ranch style nurses' homes with attractively furnished private bedrooms. Contact Director of Nursing Service, Highland Park Hospital Foundation, Highland Park, Ill.

GENERAL DUTY NURSES: Needed for staff position in crippled children's orthopedic hospital. Salary $245 per mo plus complete maintenance or $319.50 without maintenance, 15 days vacation, 15 days sick leave, 5 day work week. Contact Director of Nurses, Carrie Tingley Hospital for Crippled Children, Truth or Consequences, N.M.

GENERAL DUTY NURSES: Interesting work and environment, salary and quarters excellent. Write MMM Hospital, Nome, Alaska

GENERAL DUTY NURSES: 50 bed approved hospital located in mountainous portion of Colo. College town. Salary $275, 40 hr wk. sick leave, vacation bonus. Contact Superintendent, Community Hospital, Alamosa, Colo.

GENERAL DUTY NURSES: Salary $250 per mo for 8 hr day, 40 hr wk, 2 wks vacation and 6 pd holidays. New 60 bed hospital located on the shores of Lake Michigan. Apply Administrator, Memorial Hospital, Manitowoc, Wis.

GENERAL DUTY NURSES—AT MEDICAL CENTER: Start $275 for 40 hr wk, $5 increases at 3, 9 and 15 mos. and $10 increase

Best-known combination to break up congestion of colds— steam and Vicks VapoRub!

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after 24 mos., overtime premium pay, 2 wks paid vacation, 6 pd holidays, sick leave, free medical services, Social Security. We pay hospital insurance, life insurance, retirement annuity. Apply Personnel Director, Rochester Methodist Hospital, Rochester, Minn.

GENERAL DUTY STAFF NURSE: New and modernized 300 bed general hospital offers top salaries and opportunities to advance. Evenings $76.80-$89.60 per wk, nights $73.60-$86.10, days $64.00-$75.60. Openings in Medical, Surgical, Obstetrics, Pediatrics, Operating Rooms and Emergency Room. 40 hr wk, merit increases, liberal policies. On Long Island Sound, 45 mins to N.Y.C. Modern nurses residence and school. Apply Director of Nursing, Stamford Hospital, Stamford, Conn.

GENERAL DUTY STAFF NURSES: For evening and night duty, 40 hr wk, vacation and sick leave, salary daily rate, minimum earnings $312 per mo. Apply Director of Nurses, Englewood Hospital, 6001 S. Green St., Chicago 12, Ill.

GENERAL DUTY, SURGICAL & PEDIATRICS NURSES: For 275 bed general hospital in residential suburb of Chicago. 40 hr. wk. Cash salary and live in: $265 day duty, $275 pm duty, $280 night duty—plus private room in new nurses' residence, 3 meals per day and free laundry of uniforms. Cash salary and live out: $310 day duty, $320 pm duty, $325 night duty—plus one meal and free laundry of uniforms. Low rental apartments available for married nurses. Planned service increases at regular intervals. Many other benefits. Write Personnel Director, MacNeal Memorial Hospital, Berwyn, Ill.

GENERAL STAFF NURSES: For all depts. 340 bed hosp conveniently located near NYC. 40 hr 5 day wk, beginning salary $260 per mo, $30 bonus for 2:30-11pm, $20 bonus for 10:30 pm-7am. Extra bonus for OR and Delivery Room. Increments are given every 6 mos for 5 yrs. 1 meal and laundering of uniforms gratis. Living quarters available at moderate cost. Excellent personnel policies. Overtime pay. 4 wks vacation after 1 yr, 8 pd holidays. Sick time cumulative to 60 days. In-staff educational program. Blue Cross insurance available. Pleasant working surroundings. Apply Director of Nursing Service, Presbyterian Hospital, Newark, N.J.

GENERAL STAFF NURSES: For 200 bed general hospital. Openings in Ped, O.B. & Med.-Surg. Minimum starting salary $255. 40 hr work wk, special consideration given for experience and qualifications. Merit increases at 6 mo, 12 mo and annually thereafter. Evening and night duty differential $10. Good personnel policies. Rooms available $20 per mo. Write Dir. of Nursing Service, Memorial Hospital, Casper, Wyo.

GENERAL STAFF NURSES: This is a friendly place to work in preferred dept. of 200 bed JCAH general hospital with an active building program. Liberal personnel policies include 40 hr wk, retirement plan, paid hospitalization insurance premium, accumlative 30 day sick leave, 2 wks vacation, 6 holidays annually, meals at cost, rooms at $20 per mo, 40 mins. from Detroit. Initial salary evenings $336.80-$371.47, nights $322.80-$357.47, days $306.80-$341.47. For details write Director of Nursing, Wyandotte General Hospital, Wyandotte, Mich.

GENERAL STAFF NURSES: 270 bed general hospital and 72 bed maternity hospital. Starting salary $305 a month. $5 month tenure increase for each 6 mos to maximum of $335. $25 additional for afternoon and night. $25 additional for surgery. Liberal paid annual vacation. 7 paid holidays, 8 hr day and 40 hr wk, Social Security and employer-paid health and life insurance program. Apply to Director of Nurses, Sutter Hospital, Sacramento, Calif.

GENERAL STAFF NURSES: For 60 bed hospital very well equipped and modern, located in northern Florida. Good personnel policies, increase in salary every 6 mos, holidays with pay, sick leave with pay and pd vacation. Apply Directress of Nurses, Catherine M. Hurst, R.N., Suwannee County Hospital, Live Oak, Fla.

GENERAL STAFF NURSES, MEN AND WOMEN: Opportunity to learn nursing team leadership in 400 bed well equipped, general hospital. Monthly salaries $310 to $350, plus differential of $30.00 monthly for evenings or nights. Attractive personnel policies. Comfortable single room accommodations in residence, $20 to $25 monthly. Convenient transportation to colleges and city center. Write to: Director of Nursing Service, Mount Sinai Hospital Medical Center, 2750 West 15th Place, Chicago 8, Ill.

GRADUATE NURSES: For medical and surgical services, modern 263 bed mid-Manhattan hospital. 5 day, 40 hr. wk. Starting salary, scrub nurses, O.R. $301, floor duty $291, Eves. $330, nights, $320. uniform laundry. Four annual increases, 4 wks. vacation, 11 holidays, sick leave 12 days per year cumulative, social security health service, free hospitalization. Opportunities for special assignments, research nursing bonuses and supplementary study. Housing agent available. Apply Supt. of Nurses, James Ewing Hospital, 1250 First Ave., New York 21, N.Y.

GRADUATE NURSES: Positions for those who either have or are willing to obtain Colorado registry. Floor duty, rotating shifts, uniform laundry and meals furnished, 2 weeks paid vacation and 7 days sick leave per year. 35 bed hospital in a growing community. Southwest Memorial Hospital, Cortez, Colo.

GRADUATE NURSES: For general duty, 75 bed general hospital, new, air-conditioned with modern equipment. Beginning salary $250 a mo with differential for evening and night duty and operating room nursing. Good personnel policies. 5 day, 40 hr wk, vacation, pd sick leave, holiday time. Located in beautiful central Florida. Apply Director of Nurses, Seminole Memorial Hospital, Sanford, Fla.

GRADUATE REGISTERED NURSES: For Medical, Surgical, Obstetrical and Pediatric services 150 bed general hospital, 40 hr wk, accumulative sick leave to 30 days, annual vacation of 3 wks, 6 holidays, Social Security and Blue-Cross benefits. Salary, staff $255-$270, 7-3 duty, $15 differential for 3-11 and 11-7 duty. Apply Director of Nursing, Schoitz Memorial Hospital, Waterloo, Iowa.

GRADUATE STAFF NURSES: For Medical, Surgical and Obstetrical Services. Also vacancies on operating room staff. Salary $265 per mo for 8 hr day 40 hr wk. Annual vacation and sick leave. Retirement benefits if desired. Apply Administrator, Robinson Memorial Hospital, Ravenna, Ohio.

INDUSTRIAL, OFFICE: (a) Chief Nurse, leading steel company, 25,000 employees, maintain central clinic, 5 dispensaries, 6 full time physicians, 30 R.N.'s. $6000. E. (b) Experienced Office Nurse with college degree, teach course "Physician's Asst." small coed school. $5500, 9 mos, MW. RN 1-5 Burneice Larson, Medical Bureau, 900 N. Michigan Ave., Chicago, Ill.

MALE NURSES: Staff, employee med. center, U.S. Oil company foreign operation, industrial first aid. $7000, West Indies. RN 1-6 Burneice Larson, Medical Bureau, 900 N. Michigan Ave., Chicago, Ill.

MEDICAL-SURGICAL SUPERVISOR-ADMINISTRATIVE: 500 bed voluntary hospital, 10 mi from NYC with direct transportation to Times Square in 35 mins. Universities and colleges available both in New York and New Jersey for further education. B.S. Degree and/or satisfactory experience in supervision preferred but will consider person with satisfactory experience working towards degree. Salary dependent upon education and experience. 40 hr wk, 8 holidays with full pay, 4 wks vacation yearly, liberal sick leave. Write to: Director of Nursing, Newark Beth Israel Hospital, 201 Lyons Ave., Newark 12, N.J.

NURSE ANESTHETIST: For approved general hospital. Must be able to administer latest types of anesthetic agents. Salary $375 to $400 per mo plus full maintenance. Annual vacation and sick leave. Retirement benefits if desired. Apply Administrator, Robinson Memorial Hospital, Ravenna, Ohio.

NURSE ANESTHETISTS: Immediate opening for 2 anesthetists to complete a staff of 5 in

a large group of 30 doctors. No obstetrical call. Paid vacations. Starting salary $450, more with experience. Apply to Personnel Director, Christie Clinic, Champaign, Ill.

NURSES: Graduate, registered, staff, inservice education, liberal personnel policies, rotating shifts. Located near Gulf. Social Security and retirement plan available. Starting salary $300. Apply Nursing Supervisor, Polio Center, 1801 Buffalo Drive, Houston 3, Tex. CA 4-7875.

NURSES: Modern 200 bed, fully accredited hosp. in beautiful Cumberland Valley college town, has openings in General Duty (Medical and Surgery), Operating Room, Pediatrics, Maternity and Nursery. Friendly, informal atmosphere. 40 hr wk, 7 pd. holidays. Free hospitalization, Social Security, 2 wks vacation after 1 yr, other benefits. Apply Dorothy D. Bollinger, R.N., Director of Nursing, Chambersburg Hospital, Chambersburg, Pa.

NURSES: We, an expanding 224 bed nonsectarian general hospital, JCAH approved with temporary NLN Accredited School of Nursing, located near Stewart Field Air Base and West Point, one hr from NYC, and half hr. from resort areas have the following to offer you: Openings at all levels with differentials for eve and night duty, bonus for OR call, 40 hr wk, Social Security, cumulative sick leave, half Blue Cross premiums pd by hospital, 7 pd holidays, low cost cafeteria, regular merited increments, educational subsidies, social and advancement opportunities, excellent personnel policies, in-service education, health program, friendly cooperative working relations and conditions, air-conditioned operating room and recovery room, democratic philosophy and constant improvements in physical plant, equipment, personnel policies and nursing care. We are interested in you. Contact Director of Nursing, St. Luke's Hospital, Newburgh, N.Y.

NURSES: General hospital, 236 beds, new building, modern equipment. 30 miles from New York City. Liberal personnel policies. Write Director of Nursing, Morristown Memorial Hospital, Morristown, N.J.

NURSES: General Duty, for 30 bed hospital 35 miles from New York. Excellent salary. Apply Administrator Tuxedo Memorial Hospital, Tuxedo Park, N.Y.

NURSES WANTED: A qualified Instructor in Tuberculosis Nursing. Salary range $300 to $375 per month. Charge nurse—salary range $275 to $350 per month. Staff nurse—salary range $240 to $275 per month. Complete maintenance with nicely furnished room available at a cost of $30 a month. Fringe benefits and liberal vacation, holidays, and sick leave allowance. Beginning salary commensurate with qualifications. Apply to Supt. of Nurses, Idaho State Tuberculosis Hospital, Gooding, Idaho.

OPERATING ROOM NURSES: For 200 bed hospital. Openings for Ass't Supervisor and Staff. Minimum starting salary $255. 40 hr work wk, Special considerations given for experience and qualifications. $20 per mo for call. Average call 2 nights per wk. Good personnel policies, rooms available $20 per mo. Write Director of Nursing Service, Memorial Hospital, Casper, Wyo.

OPERATING ROOM NURSES: For 165 bed general hospital. 30 hr wk, vacation and sick leave, salary daily rate, minimum earnings $325 per mo. Apply Director of Nurses, Englewood Hospital, 6001 S. Green St., Chicago, Ill.

OPERATING ROOM NURSES—AT MEDICAL CENTER: Start $285 for 40 hr wk $5 increase at 3, 9, and 15 mos., $10 increase after 24 mos. Overtime premium pay, paid vacation, 6 paid holidays, sick leave, free medical services. Social Security. We pay hospitalization insurance, life insurance, retirement annuity. Apply Personnel Director, Rochester Methodist Hospital, Rochester, Minn.

OPERATING ROOM SUPERVISOR: Complete new surgical suite, 200 bed hospital. Salary open. Suburban Hospital, Bethesda, Md.

OPERATING ROOM SUPERVISOR: Experience desirable but not necessary. Sick leave and annual vacation. Retirement benefits available. Salary open. Apply Administrator, Robinson Memorial Hospital, Ravenna, Ohio.

OPERATING ROOM SUPERVISOR: 118 bed Gen. Hosp. in a beautiful residential suburb along the North Shore of Chicago. Modern ranch style nurses homes with attractively furnished private bedrooms. 40 hr. wk. Contact Director of Nursing Services, Highland Park Hospital Foundation, Highland Park, Ill.

O.R. SUPERVISOR: 85 bed general hospital in North Central Pennsylvania, resort area. O.R. staff of 4. Live out, salary commensurate with experience and qualifications. Apply Director Nursing Service, Soldiers and Sailors Memorial Hospital, Wellsboro, Pa.

OR SUPERVISOR-INSTRUCTOR, INSTRUMENT NURSES: Immediate opening in air-conditioned 4 room OR suite. Expanding 224 bed JCAH approved general hospital. School of Nursing State approved and Temporary NLN accredited. Excellent personnel policies.

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Contact Director of Nursing, St. Luke's Hospital, Newburgh, N.Y.

PALM SPRINGS CALIFORNIA OPPORTUNITIES: Staff nurses and operating room. 38 bed hospital in America's winter resort area. Wages are top for resort area. 5 day wk, 7 pd holidays, 2 wks vacation after 1 yr, 3 wks after 3 yrs and sick leave. If interested contact Director of Nurses, Desert Hospital, P.O. Box EE, Palm Springs, Calif.

PEDIATRIC INSTRUCTOR: Who knows what pediatrics really is, and how to interpret it to student nurses. Superior working conditions, freedom to use personal initiative and imagination, cooperative co-workers and associates in outstanding Children's Hospital of friendly Kentucky Derby City. Salary entirely dependent upon preparation and experience. This is an unusual opportunity for an alert, ambitious nurse who would enjoy doing creative work in a happy atmosphere. For details write Director of Nursing, Children's Hospital, Louisville, Ky.

PEDIATRIC TEACHING SUPERVISOR: For 400 bed modern general hospital. 40 bed pediatric unit, NLN accredited school, 165 students. Liberal personnel policies, salary range $340-400 per mo. Complete maintenance available. Box BRO-1 c/o R.N. Magazine, Oradell, N.J.

PEDIATRIC TEACHING SUPERVISOR: For 32 bed unit in 220 bed general hospital with School of Nursing. Apply Director of Nursing, Orangeburg Regional Hospital, Orangeburg, S.C.

PRESBYTERIAN HOSPITAL IN PHILADELPHIA: Make sure at our expense! Coming to Philadelphia to work? Observe team nursing and the high standard of patient care in this hospital for two weeks with full salary. Individual orientation. Then make your decision. Excellent personnel policies. Salary based on experience. Maintenance provided. Apply: Director of Nursing, Presbyterian Hospital, Philadelphia 4, Pa.

PUBLIC HEALTH: (a) Instructors, supervisors, staff, assist promotion PH programs, China, Calcutta, Brazil, Rome, pd air travel, good living facilities, $4000-$4500 plus. (b) Assoc. Dir. VNA. Charge educ prog. succeed Dir. near future, cultural univ. city, mild climate. $6000. (c) Supv. exp. tb, heart, act as field counselor, public relations, community org. desired $4800-7200. E., M.W. RN 1-7 Burneice Larson, Medical Bureau, 900 N. Michigan Ave., Chicago, Ill.

QUALIFIED PUBLIC HEALTH NURSES: In Baltimore County Health Dept. Suburban, industrialized and rural areas. Population 354,200. 8 mi from Balto. Generalized program including school health program. For use of personal car 7 cts per mi. Cars to be furnished in July '57. Sick leave and vacation after 6 mos, 5 day wk, retirement plan, 13 pd holidays. Senior Public Health Nurse beginning salary $3399, Junior Public Health Nurse $3099. Write to Dr. Wm. H. P. Warthen, Health Officer, Baltimore County Health Dept. Towson 4, Md.

REGISTERED GENERAL DUTY NURSES: Immediate positions. 600 bed general hospital in beautiful residential area 35 mi from Los Angeles. Pleasant year round climate and diversified recreational facilities. Beginning salary $303 per mo. Increase to $319 after 6 mos. Subsequent annual increases to $375. 40 hr work wk, 3 wks vacation retirement and sick leave programs, group insurance.

Good advancement opportunities. Apply through Orange County Personnel Dept., 644 N. Broadway, Santa Ana, Calif.

REGISTERED NURSE: For Industrial Firm in The Pee Dee Area of South Carolina. Rotating shift nursing duties, age 25-40, physical examination required. Give details of training and experience in first letter. Excellent salary, 40 hr wk. Apply Box SPC c/o R.N. Magazine, Oradell, N.J.

REGISTERED NURSE: Wanted July 1st thru Aug. 26, '57 for N.Y. Children's Camp. Work with resident doctor and second registered nurse. Write Camp Tagola, 26 Court St., Brooklyn, N.Y.

REGISTERED NURSE ANESTHETIST: 50 bed new modern hospital. Pleasant working conditions, good personnel policies, adequate provision for week-ends and days off. 2 wks pd vacation at end of yr. Salary open. State age, training and experience. Apply Box CCMH-1 c/o R.N. Magazine, Oradell, N.J.

REGISTERED NURSE FOR GENERAL DUTY: Starting salary $260 per mo. 40 hr wk, laundry, 1 meal per day. Long 4 day weekend per mo. 2 wks vacation. Contact: Rockmart-Aragon Hospital, Rockmart, Ga.

REGISTERED NURSES: For 200 bed hospital for tuberculosis. Starting salary $325 per mo. Maintenance available in new nurses home at nominal rates. Annual leave, 10 holidays and sick leave with pay, group insurance and retirement program. 6000 feet altitude near large summer resort area. Apply to Medical Director, Fort Stanton Tuberculosis Sanatorium, Fort Stanton, N. Mex.

REGISTERED NURSES: Two, 30 bed air-conditioned hospital, 35 mi due south of Memphis. $300 per mo, plus room & board in air-conditioned nurses' home. 6 days off each mo. Prefer one with supervisory ability for future promotions. Write or call Murray E. Hill, Administrator, Tunica Hospital, Tunica, Miss.

REGISTERED NURSES: 28 bed company owned hospital, immediate vacancy for operating room-clinic nurse. Openings for general duty. Salary $16.38 and $15.23 per day respectively, including complete maintenance. 5 day, 40 hr wk. Pd vacations, Social Security, etc. Apply Dorothy M. Haman, Supt., Steptoe Valley Hospital, East Ely, Nev.

REGISTERED NURSES: General Duty $300. Floor Supervisors $325. Increments each 6 mos, 2 wks vacation after each year's service. Retirement plan. Nurses residence, meals provided, uniforms laundered. Apply Director of Nurses, Elko General Hospital, Elko, Nev.

REGISTERED NURSES: 2 for 35 bed private hospital. 40 hr wk, $300 per mo plus meal allowance to start, $10 increase after 3 mos. Write Mr. Koch, Casita Hospital, 82-485 Miles Ave., Indio, Calif.

REGISTERED NURSES: For State Veterans' Hospital near Hartford, Conn. Salary $3540-$4980, annual raises, Civil Service benefits, full maintenance, $316 per yr. Write Veterans Home and Hospital, Rocky Hill, Conn., Captain H. H. Alvord or State Personnel Director, State Office Building, Hartford, Conn.

REGISTERED NURSES: 65 bed general hospital located 40 mi from Dallas, Tex. Starting salary $260 per mo. plus laundry of uniforms and one meal per day. Living quarters available. Apply Director of Nurses, City-County Hospital, McKinney, Tex.

REGISTERED NURSES: Are you looking for something new? Staff and Ass't Head Nurse

positions open in beautiful new University of Oregon Medical School Hospital located on hill overlooking Portland, Ore. Medical, Surgical, Pediatric and Psychiatric units. Excellent opportunities for learning, both in clinical areas and on campus. Staff members may take courses at reduced tuition rate ($3 per quarter hr) leading to baccalaureate or Masters Degrees at the Nursing School on campus. Liberal personnel policies. The Northwest is a wonderful place to live and work. Write to Director of Nursing Service for full information, U of O Medical School Hospital, 3181 SW Sam Jackson Park Road, Portland 1, Ore.

REGISTERED NURSES: For general duty for 150 bed tuberculosis sanatorium in Bartlett, Alaska. Starting salary $250 per month plus complete maintenance with a $10 raise each six months to a maximum base pa yof $280. $10 extra for evening and night shift. 8 hr. day, 40 hr. wk., 8 to 4, 4 to 12, 12 to 8 shifts. New modern nurses residence. Write to Director of Nurses, Seward Sanatorium, Bartlett, Alaska.

REGISTERED NURSES: General staff duty. Beginning salary $285 per month and $10 shift differential, 40 hr. wk., 7 pd. holidays, yearly vacation, health insurance program. Uniform laundry provided. Mark Twain Hospital District, San Andreas, Calif.

REGISTERED NURSES: Positions for general duty registered nurses, starting salary $250 per month. Positions also available for specially trained nurses in the following classifications; operating room, anesthetist, infectious and contagious, pediatrics, premature infant care, obstetrical and tuberculosis. Salary depending on qualifications. For all groups living in facilities available, average 44 hr. wk. 11 holidays per year, sick leave on indefinite accumulation basis, free hospitalization, one free meal while on duty, 8 hr. day, and laundry $4 per month. Apply Superintendent, Lafayette Charity Hospital, Lafayette, La.

REGISTERED NURSES: Gen duty, 25 bed hosp, starting salary $275 per mo, room and board. 40 hr wk, rotating shifts, 8 holidays, sick leave, vacation. Apply to Director of Nurses, Mineral County Hospital, Hawthorne, Nev.

REGISTERED NURSES: For Veterans Administration Hospital, Fort Howard, Maryland, located 15 mi from Baltimore. 437 bed GM&S Hospital. Personnel policies include 40 hr wk, 30 days annual leave, 15 days sick leave and 8 holidays. Salaries, Junior Grade $4025, Associate Grade $4730 with yearly increases. Non-housekeeping quarters available. Uniform allowances and laundry provided. Openings for both men and women interested. Contact Chief, Nursing Service, VAH, Fort Howard, Md.

REGISTERED NURSES: Salaries at Pinehaven have been increased to $240 per mo, meals and full maintenance included. 5 day wk, usual holidays, vacations and accruals in vogue. Congenially operated by Dr. Joseph O. Smigel. Apply Pinehaven Nursing Home, Pinewald, N.J. Telephone Toms River 8-2050.

REGISTERED NURSES CONSIDERING RETIREMENT: You can find remunerative light charge nurse positions at Pinehaven, either full or part-time. Maintenance within the building if desired. Apply Pinehaven Nursing Home, Pinewald, N.J., Dr. Joseph O. Smigel, Medical Director. Telephone Toms River 8-2050

[Turn the page]

REGISTERED NURSES FOR GENERAL DUTY, OBSTETRICAL, AND SURGICAL NURSING: 80 bed hospital. Six miles from down town Memphis. 40 hr. wk., other benefits. Contact Director of Nurses, Critterden Memorial Hospital, West Memphis, Ark.

REGISTERED PROFESSIONAL NURSES: For supervisory, educational and general staff positions. Liberal personnel policies. 40 hr. week. Differential salary for evening, nights and operating room. Social Security. Christ Hospital, 176 Palisade Ave., Jersey City, N.J.

REGISTERED STAFF NURSES: Never a dull moment for the graduate nurses who decide they would like to join us at the University of Texas Medical Branch Hospitals. We work a 40 hr wk in our air-conditioned hospitals leaving 128 hrs to enjoy the beach and nearby resorts. Galveston boasts an average temperature in the low 70's which means that swimming, fishing, horseback riding and sailing can be enjoyed year 'round. We have positions available in the clinical area of your choice. Staff nurses monthly salaries begin at $264 for rotation and $277 for extended eves or nights. Uniforms laundered free. Liberal personnel policies and opportunities for advanced study leading to both B.S. and M.S. Degrees. Write for further information to the : Director of Nursing Service, University of Texas Medical Branch Hospitals, Galveston, Tex.

SCHOOL OF ANESTHESIA: Approved by the American Association of Nurse Anesthetists. Open to registered nurses of accredited schools of nursing. Applications being received for February and August 1957 classes. For complete information and application blanks write to Everard R. Hicks, Director of the School of Anesthesia, The McLeod Infirmary, Florence, S.C.

STAFF NURSE POSITIONS AVAILABLE: 600 bed General and Tuberculosis Hospitals with student programs. In central valley city of 108,000. State and junior colleges afford opportunity for advanced education. Liberal personnel policies. Salary $300 with 4 annual increases to $341. Full maintenance available at $45 monthly. Write to Associate Director of Nursing Service, Fresno County General Hospital, Fresno, Calif.

STAFF NURSES: For all departments. Modern 190 bed general non-sectarian hospital located in beautiful Southwestern Michigan. 90 mi from Chicago. 40 hr wk, 8 hr tours. Excellent salary, good personnel policies. Nurses working toward a degree may be interested in our Community College. Apply Director of Nursing Service, Mercy Hospital, Benton Harbor, Mich.

STAFF NURSES: For 82 bed fully approved general hospital, 44 hr wk. Paid vacation and sick leave. Vacancies on all shifts. Apply Administrator, Fairfield Memorial Hospital, Fairfield, Ill.

STAFF NURSES: 300 bed general hospital located in the Hollywood District of sunny California. Beginning salaries $300-$315 per mo, maximum $330-$355, 5 day wk, 6 holidays, pd vacation and sick leave. For further information write Director Nursing Service, Hollywood Presbyterian Hospital, Los Angeles 27, Calif.

STAFF NURSES: For 150 bed modern fully approved general hospital located in the "Fruitbowl of the Nation". Starting salary $260 up, 8 merit increases, 40 hr wk, differential for afternoon and night duty. Apply Director of Nurses, Yakima Valley Memorial Hospital, Yakima, Wash.

STAFF NURSES: For 225 bed Southern California hospital on coast. Attractive personnel policies including 40 hr wk. Salary for California registered nurses starts at $265 and

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